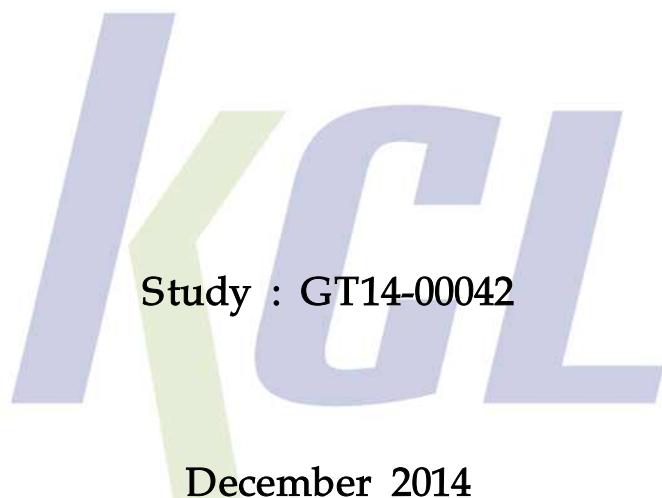


Final Report

Subchronic Inhalation Toxicity Study of
MWCNT in Fisher 344



the way to trust **KCL** Korea Conformity Laboratories

BioConvergence Technology Laboratory

Statement

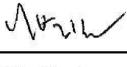
Study code : GT14-00042

Title : Subchronic Inhalation Toxicity Study of MWCNT in Fisher 344

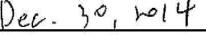
This study has been performed in compliance with the principles of Good Laboratory Practices and test guidelines in following documents.

1. Standards of Good Laboratory Practice, National Institute of Environment Research (NIER)[Notice No. 2013-1 (revised 9th, Jan., 2013)]
2. Guideline for the Testing of Chemical Hazards, National Institute of Environment Research (NIER)[Notice No. 2013-2 (revised 9th, Jan., 2013)]
3. OECD Guidelines for the Testing of Chemical No. 413 'Subchronic Inhalation Toxicity: 90-Day Study'(Adopted 7th Sep, 2009)

The stated object in the study protocol was achieved and there were no significant deviations from the aforementioned regulations that affected the quality or integrity of the study. Therefore, the justification of all data in this study was confirmed. The information of the test substance was written from the document that the sponsor provided.



Byung-Gil Choi

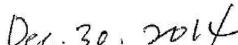


Dec. 30, 2014
Date

Study Director
BioConvergence Technology Laboratory



Jin-Kyu Lee
Managing Director
BioConvergence Technology Laboratory



Dec. 30, 2014
Date

QUALITY ASSURANCE STATEMENT

Study No. : GT14-00042

Title : Subacute Inhalation Toxicity Study of MWCNT in Fisher 344

This study was subject to audit by the independent Quality Assurance Unit of KCL as indicated below. The findings of each audit were reported to the study director and management as prescribed by Standard Operating Procedures.

The final report audit was designed to confirm that as far as can be reasonably established the methods described and results incorporated in the final report accurately reflect the raw data produced during the study.

Audit phases and dates reported to the responsible personnel were as indicated below and these were based upon the audit records.

Phase Inspected	Date	Reports to Study Director	Reports to Management
Study Plan	2014. 01. 28	2014. 01. 28	2014. 01. 28
Animal receipt	2014. 02. 06	2014. 02. 06	2014. 02. 06
Storage of Test substance and vehicle	2014. 02. 06	2014. 02. 06	2014. 02. 06
Preparation of test substance	2014. 02. 13	2014. 02. 13	2014. 02. 13
	2014. 03. 27	2014. 03. 27	2014. 03. 31
	2014. 04. 30	2014. 04. 30	2014. 04. 30
Animal care and Administration	2014. 02. 13	2014. 02. 13	2014. 02. 13
	2014. 03. 27	2014. 03. 27	2014. 03. 31
	2014. 04. 30	2014. 04. 30	2014. 04. 30
Clinical sign	2014. 02. 13	2014. 02. 13	2014. 02. 13
	2014. 03. 27	2014. 03. 27	2014. 03. 31
	2014. 04. 30	2014. 04. 30	2014. 04. 30
Ophthalmoscopy and urinalysis	2014. 05. 10	2014. 05. 10	2014. 05. 12

Necropsy and clinical pathology	2014. 05. 13	2014. 05. 13	2014. 05. 13
	2014. 05. 14	2014. 05. 14	2014. 05. 14
	2014. 05. 15	2014. 05. 15	2014. 05. 15
	2014. 05. 16	2014. 05. 16	2014. 05. 16
	2014. 08. 12	2014. 08. 12	2014. 08. 12
Preparation of specimen and Observation	2014. 06. 19	2014. 06. 19	2014. 06. 19
	2014. 07. 22	2014. 07. 22	2014. 07. 22
	2014. 09. 24	2014. 09. 24	2014. 09. 24
Raw data	2014. 11. 18	2014. 11. 18	2014. 11. 18
Final Report	2014. 11. 18	2014. 11. 18	2014. 11. 18

QA director = Song, Kyung Seuk Ph.D. Date 2014. 11. 18
 Auditor, Quality Assurance

* signed original

Study Personnel

Principal Investigator Jae-Hyuck Sung* **Date** 18 November 2014

Formulation Jae-Hyuck Sung* **Date** 18 November 2014

Animal care Hye-Jin Kim* **Date** 18 November 2014

Necropsy & Pathology Hye-Jin Kim* **Date** 18 November 2014

Archiving Hyo-Dong Kim* **Date** 18 November 2014

* Signed original

Title	Subchronic Inhalation Toxicity Study of MWCNT in Fisher 344			
Objective of Study	The purpose of this study is to evaluate subchronic inhalation toxicity in SPF-F344 rats after nose-only exposure to MWCNT for 6 hours/day, 5 days/week during 13 weeks, and to investigate the NOAEL and target organ. And the influence of test substance is evaluated after 13 weeks recovery period.			
Sponsor	Name	:	Bioconvergence Technology Laboratory Korea Conformity Laboratories	
	Client	:	Jin-Kyu Lee	
	Address	:	8, Gaetbeol-ro 145 beon-gil, Yeonsu-gu, Incheon, 406-840, Korea	
	Tel.	:	+82-32-859-4041	Fax : +82-32-858-0020
Testing facility	Name	:	Bioconvergence Technology Laboratory Korea Conformity Laboratories	
	Address	:	8, Gaetbeol-ro 145 beon-gil, Yeonsu-gu, Incheon, 406-840, Korea	
	Tel.	:	+82-32-859-4050	Fax : +82-32-858-0020
Study Schedule	Approval of test protocol	:	28 January	2014
	Animal acquisition	:	06 February	2014
	Initiation of exposure	:	11 February	2014 (male)
		:	13 February	2014 (female)
	Termination of exposure	:	12 May	2014 (male)
		:	14 May	2014 (female)
	Necropsy (exposure group)	:	13 May	2014 (male)
		:	15 May	2014 (female)
	Necropsy (recovery group)	:	12 August	2014 (male)
	BAL (exposure group)	:	14 May	2014 (male)
		:	16 May	2014 (female)
	Submission of pathologic report	:	21 October	2014
	Submission of final report	:	18 November	2014
Archiving of study data	1) Archiving period : Least 5 years after the study termination 2) Data : Study protocol, test substance data, animal acquisition data, raw data, GLP documents 3) Storage room (1) Archive 1 : CD and relevant documents (2) Archive 2 : Specimens and slides			

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1. SUMMARY

This study was performed to evaluate subchronic inhalation toxicity of multi-wall carbon nanotube (MWCNT) using specific pathogen free (SPF) - Fisher 344 (F344) rats with the concentration of 0, 0.17 (low-dose group), 0.51 (middle-dose group) and 1.01 (high-dose group) mg/m³. The rats were exposed to test substance for 6 hours/day, 5 days/week during 13 weeks in nose-only inhalation chamber. Grouping consisted of 15 male and 10 female rats in each group. Test method conformed to Guideline for the Testing of Chemical Hazards, National Institute of Environment Research (NIER)[Notice No. 2013-2 (revised 9th, Jan., 2013)] and OECD Guideline for Testing of Chemicals No. 413 'Subchronic Inhalation Toxicity' (Adopted 7th Sep, 2009).

The environment and concentration of MWCNT for animal exposure chamber were measured during exposure periods. Mortalities, clinical signs, body weight and food consumption changes were evaluated in exposure periods, and necropsy, organ weight, hematology, blood biochemistry, blood coagulation time, bronchoalveolar lavage (BAL), and histopathological test, were conducted after exposure the test substance in exposure and recovery groups. The results were as follows,

- (1) The temperature, humidity, oxygen, carbon dioxide (CO₂) and pressure for the exposure period were recorded as 22.75±0.10 °C, 47.01±0.38 %, 20.08±0.01 %, 328.32±8.81 ppm, - 291.41±1.37 pascal in Chamber 1 (control), and 22.38±0.08 °C, 46.36±0.43 %, 20.12±0.00 %, 368.58±1.52 ppm, - 293.12±1.43 pascal in Chamber 2 (low dose group). Chamber 3 (middle dose group) was recorded as 22.48±0.08 °C, 52.39±0.52 %, 20.12±0.00 %, 371.60±1.03 ppm, - 294.09±1.36 pascal, and Chamber 4 (high dose group) was recorded as 22.87±0.07 °C, 56.25±0.61 %, 20.16±0.00 %, 348.96±1.45 ppm, - 289.86±1.26 pascal.
- (2) The mass concentration of test substance was recorded as 0.17±0.0002 mg/m³, 0.51±0.0003 mg/m³, 1.01±0.0080 mg/m³ for low, middle and high dose respectively. The particle number of clean air entering the control chamber was 0.075±0.0300 particles/cc in Channel 1 (0.3 μm) and 0.018±0.0049 particles/cc in Channel 2 (1.0 μm) of the particle sensor.
- (3) The results of TEM analysis, the shape was shown as fiber shape, and the main element was carbon through the analysis of energy dispersive

X-ray spectrometer (EDX). Geometric mean (GM) and geometric standard deviation (GSD) of the cumulative median length (CML) were [REDACTED] nm and [REDACTED] respectively.

- (4) In the results of clinical signs during acclimation, exposure periods and recovery periods, the restlessness and convulsion were observed in the one case of exposure group in the medium dose of male rats at 80 days after exposure, and that animal was excluded in exposure. The day after, that animal was dead. Except for that, there were no abnormal clinical signs and mortalities in either male or female rats of exposure periods and in male rats during recovery periods.
- (5) There was no significant difference in body weight change between control and exposure groups in either male or female rats of exposure and recovery periods.
- (6) The changes of food consumption in the exposure and recovery periods were not statistically dose-dependant, and it was considered that test substance was not influenced the food consumption.
- (7) Ophthalmologic examination was unremarkable in all rats and there were no statistically significant specific sings relating to the test substance in high-dose groups in either male or female rats of exposure and recovery groups respectively.
- (8) In urinalysis, there were no significant changes in either the male or female rats of exposure and recovery groups respectively.
- (9) In necropsy, no abnormal lesions related with the test substance were observed in all animals of exposure and recovery groups respectively.
- (10) In organ weights, there were no significant differences related with the test substance in either male or female rats for all exposure and recovery groups respectively.
- (11) In hematology, blood coagulation time and blood biochemistry, there were no significant differences related with the test substance in either male or

female rats for all exposure and recovery groups respectively.

- (12) In histopathological examination, findings related with the test substance were not observed in either male or female rats for all exposure and recovery groups respectively.
- (13) In bronchoalveolar lavage (BAL), the value of cell number and inflammatory markers in BAL fluid was not statistically dose-dependant, and it was considered that test substance was not influenced the BAL test.

In conclusion, NOAEL (no observed adverse effect level) value for the inhalation toxicity of MWCNT is considered to 1.01 mg/m³ and the target organ is not observed with considering of the each test items and histopathological examination in this study.

2. TEST SUBSTANCE AND VEHICLE

1) Test substance (Annex 1)

- (1) Name : MWCNT
- (2) Product Name : K-Nanos-100P
- (3) Lot No. : No data
- (4) Received date : 25 January 2013
- (5) Received quantity : 666.89 g (including a container weight)
- (6) Appearance : Black powder
- (7) Purity : Carbon content > 90 %
- (8) Storage condition : Ambient room temperature and humidity
- (9) Stability : Stable under refrigeration
- (10) Handling : Stable under refrigeration
- (11) Supplier : Kumho petrochemical Co., Ltd.

2) Vehicle

- (1) Name : HEPA filtered fresh air

3) Storage and Treatment

The test substance was kept in a storage room (108-2). At completion of the study, the remaining test substance was kept in a storage room (108-3).

4) Formulation of the test solution

The mixture of test substance and fresh air was used after maintain a constant temperature and pressure using the carbon nanotube (CNT) generator (CNT generator, HCT, Korea; MAI-099-02).

3. MATERIALS AND METHODS

1) Test animals

- (1) Species and strains : Specific Pathogen Free(SPF) Fisher 344 rats
(F344/N Slc)
- (2) Supplier : Central Lab. Animal Inc.
(5F Gun B/D, 7, Baumoe-ro 7-gil, Seocho-gu, Seoul, Korea)
- (3) Producer : Japan SLC, Inc.

(3371-8 Kotoh-cho, Hamamatsu, Shizuoka Prefecture 431-1103)

(4) Reason for selection of the species

The animals used in this study, F344 rats, have been applied widely in general toxicity tests as a suitable experimental animal for toxicity testing. In addition, sufficient raw data have been accumulated, and such data are available in interpretation and evaluation of study results.

(5) Date of acquisition : 06 February 2014

(6) Number of animals received

① Male : 66

② Female : 44

(7) Age of animals received : 7 weeks

(8) Body weights on arrival (mean±S.E)

① male : 113.58 ± 0.81 g

② female : 114.40 ± 0.84 g

(9) Quarantine and acclimation

Animal observation performed on date of acquisition. Microorganism test result was obtained from supplier. Acclimation duration was more than 5 days. Only the most healthy animals were used for study after observing general conditions in the acclimation period. (Annex 2)

(10) Age at the initiation of the exposure : 8 weeks

(11) Body weights at the exposure (mean±S.E)

① male : 146.65 ± 0.94 g

② female : 136.55 ± 0.79 g

(12) Number of animals used : male 60, female 40

(13) Grouping

The animals were stratified randomly by body weight after measuring body weight one day before initiation of exposure.

(14) Identification of individual animals

To distinguish animals, skin marking (blue marking during acclimation and black marking during main study) was used. Cage card was used for each cage and the animal use log was posted at the entrance of animal room with indication of study number, title, duration of use, name of study director, and name of study personnel.

(15) Handling of remaining animal

Remaining animals sacrificed at the planned date.

(16) Compliance with the guidelines of animal ethics

This study was approved by the IACUC of Korea Conformity Laboratory

(approval number : IA14-00083).

2) Environmental and Housing Condition (Annex 3)

(1) Animal care room

- ① Acclimation period : Animal care room in inhalation toxicity room
- ② Exposure period : Animal care room in inhalation toxicity room
- ③ Recovery period : Animal care room in inhalation toxicity room

(2) Range of temperature and humidity

- ① Acclimation period : 21.7±0.4 °C of temperature
43.9±1.7 % of relative humidity
- ② Exposure period : 21.6±1.1 °C of temperature
49.5±7.3 % of relative humidity
- ③ Recovery period : 21.5±0.7 °C of temperature
56.5±2.8 % relative humidity

(3) Lighting cycle : 12 hrs of lighting duration

(lighting up at 8 a.m. ~ lighting out at 8 p.m.)

(4) Lighting intensity

- ① Acclimation period : 285 Lux
- ② Exposure period : 285 Lux
- ③ Recovery period : 275 Lux

(5) Ambient noise level

- ① Acclimation period : 55.6 dB
- ② Exposure period : 55.6 dB
- ③ Recovery period : 54.6 dB

(6) Ammonia concentration

- ① Acclimation period : less than 5 ppm
- ② Exposure period : less than 5 ppm
- ③ Recovery period : less than 5 ppm

(7) Housing

- ① Quarantine and acclimation period : polycarbonate cage
(500 L×306 W×200 H mm)
- ② Exposure period : wire 5-mesh cages (750 W×170 D×150 H mm)
- ③ Recovery period : wire 5-mesh cages (800 W×200 D×150 H mm)

(8) Animal number per cage

- ① Quarantine and acclimation period : Max 5 animal
- ② Exposure period : 1 animal
- ③ Recovery period : 1 animal

(9) Feeds and water

① Feeds

Radiation sterilized, solid laboratory animal feeds (Teklad Certified Irradiated Global 18 % Protein Rodent Diet, Harlan Co. Ltd., USA) were provided *ad libitum*. DooYeol Biotech Co., Ltd. supplied feeds.

② Water

Incheon, Korea municipal tap water purified by reverse osmosis filtering system was provided *ad libitum* using water bottles.

③ Certification

The feed certification which was provided from the supplier and the water certification from national certificated inspection organization were referred to examine contamination (Annex 4, 5).

3) Methods

(1) Exposure method

① Route : Inhalation (nose-only)

② Reason : Inhalation is a major route for MWCNT exposure.

③ Exposure frequency and duration : 6 hours/day, 5 days/week, 13 weeks

④ Exposure location : mainly respiratory system

(2) Dose group and target concentration

① Exposure group

Test substance	Group	Mass (mg/m ³)	Sex	N	Animal No.
MWCNT	Control exposure(CE)	0	M	10	1-10
			F	10	41-50
	Low exposure(LE)	0.2	M	10	11-20
			F	10	51-60
	Medium exposure(ME)	0.5	M	10	21-30
			F	10	61-70
	High exposure(HE)	1.0	M	10	31-40
			F	10	71-80

M; Male, F; Female

② Recovery group

Test substance	Group	Mass (mg/m ³)	Sex	N	Animal No.
MWCNT	Control recovery(CR)	0	M	5	1-5
	Low recovery(LR)	0.2	M	5	6-10
	Medium recovery(MR)	0.5	M	5	11-15
	High recovery(HR)	1.0	M	5	16-20

M; Male

③ Justification for dose setting

In the acute inhalation toxicity study (GT13-00173) and the subacute inhalation toxicity study (GT13-00174), no toxic signs were observed relating to the test substance. Therefore, the maximal mass concentration capacity for the CNT generating system was used to generate the high dose exposure in this study, and set the low and middle concentration with the ten multiple of high dose.

④ Test items

① Measurement of environment inside animal exposure chamber

Temperature, humidity, pressure, oxygen (O₂) and carbon dioxide (CO₂) were measured automatically using inhalation toxicity monitoring system at main control center for duration of exposure period.

② Generating method for MWCNT

MWCNT were generated as shown in Figure 1. It was used that the CNT generator (CG-100, HCT, Korea; MAI-099-02) and nose-only inhalation toxicity chamber (NITC 30, HCT, Korea; MAI-114-01).

③ Analysis of MWCNT concentration in exposure chamber

Mass concentration was measured with the NIOSH method 0500 using the personal air sampler and polyvinylidene fluoride membrane filter.

④ Transmission Electron Microscopy (TEM) analysis

The TEM sample, which was collected with nanoparticle collector, was requested for analysis of MWCNT shape.

⑤ Clinical signs

General clinical signs of all treated animals were observed once a day after administration during the exposure period. Individual records were maintained for each animal including the mortality, type, date and grade of clinical signs.

⑥ Body weight

Individual animal weight was recorded at acquisition, grouping, at the before exposure, once a week during the study and before necropsy.

⑦ Food consumption

Food consumption was measured once a week during the exposure periods and calculated with the difference between feed ration and residual quantity of food. The value was calculated the average consumption (g/rat/day) of the individual animals.

⑧ Ophthalmoscopy

Eyes of all animals were observed at the grouping and all animals of the control and high-dose group were subjected to eye ground examination using the ophthalmoscope (Genesis, Kowa Co. Ltd., Japan; MAI-053-01) on the last week of exposure and recovery period.

⑨ Urine samples were collected from 5 animals in each group using metabolic cages on the last week of exposure and recovery period. The urine samples were analyzed for below inspection items using urine test strips (SIEMENS) and the Urine auto-analyzer (CliniTak 50, SIEMENS, Germany; MAI-050-01).

Urinalysis	
Glucose	Urobilinogen
Bilirubin	Nitrite
Ketone body	Leukocyte
Specific gravity	Protein
Occult blood	pH

⑩ Necropsy

After the exposure, necropsy was conducted all surviving animals and animals were anesthetized with dose of 1 ml/kg pentobarbital(entobal®, Hanlim Pharm. co. Ltd.) by the injection via abdominal cavity. Blood was then drawn from the abdominal aorta, and gross findings were conducted in the subcutaneous, abdominal cavity, thoracic cavity organs and brain.

⑪ Organ weights measurement

At necropsy, the weights of below organs were measured using electric balance.

Organ weights
Testis, Ovary, Spleen, Liver, Thymus,
Adrenal gland, Kidney, Heart, Lung, Brain, Pituitary, Olfactory bulb

⑫ Blood biochemistry

The blood biochemistry was conducted with serum using the biochemistry analyzer (Hitachi7180, HITACHI, Japan; MAI-059-01). The serum was took from centrifuging blood (3,000 rpm, 10 min) collected from the abdominal aorta at necropsy. Inspection items is below.

Blood biochemistry	
AST (Aspartate aminotransferase)	CPK (Creatine phosphokinase)
ALT (Alanine aminotransferase)	ALB (Albumin)
ALP (Alkaline phosphatase)	T-BIL (Total bilirubin)
GGT (Gamma(γ)-glutamyl transferase)	A/G ratio
LDH (Lactate dehydrogenase)	TG (Triglyceride)
BUN (Blood urea nitrogen)	UA (Uric acid)
CRE (Creatinine)	Ca (Calcium)
GLU (Glucose)	IP (Inorganic phosphorus)
CHO (Total cholesterol)	Cl (Chloride)
HDL (High density lipoprotein)	Mg (Magnesium)
LDL (Low density lipoprotein)	Na (Sodium)
TP (Total protein)	K (Potassium)

⑬ Hematology

The blood was analyzed using the Hematology Analyzer (ADVIA 2120, SIEMENS, Germany; MAI-105-01), and collected in EDTA-2K vacutainers. Inspection items is below.

Hematology	
WBC (White blood cell count)	RDW (Red cell distribution width)
RBC (Red blood cell count)	PLT (Platelet)
Hb (Hemoglobin conc.)	MPV (Mean Platelet Volume)
HCT (Hematocrit)	WBC differential count
MCV (Mean corpuscular volume)	LUC (Large unstained cells)
MCH (Mean corpuscular hemoglobin)	Reti (Reticulocyte)
MCHC (Mean corpuscular hemoglobin conc.)	

⑭ Blood coagulation test

The blood coagulation test was conducted to analyze PT (prothrombin time) and APTT (active partial thromboplastin time) using the blood coagulation analyzer (ACL7000, Instrumentation Laboratory, USA; MAI-076-01). The blood samples were collected from the abdominal aorta at necropsy and anticoagulated by 3.2 % sodium citrate solution.

⑯ Storage of organ and tissue

All organs and tissues as follows were fixed in 10% formalin solution containing neutral phosphate-buffered saline. However, testis were fixed in Böuin solution and eyes were fixed in Davidson's solution.

List of organs		
Brain	Parathyroid gland	Cecum
Pituitary gland	Adrenal gland	Colon
Heart	Esophagus	Rectum
Lung	Aorta	Femur
Liver	Spinal cord	Sternum
Kidney	Sciatic nerve	Trachea
Urinary bladder	Skeletal muscle	Tongue
Mesenteric lymph node	Skin	Prostate
Thymus	Mammary gland	Testes
Spleen	Eye	Epididymis
Pancreas	Stomach	Seminal vesicle
Salivary gland	Duodenum	Ovary
Submandibular lymph node	Jejunum	Uterus
Thyroid gland	Ileum	Vagina

⑯ Histopathological examination

Fixed organs of animals in vehicle control and high dose group were made into histology slides and then histopathological examination was conducted. In the case of the organ suspected as target organ, all of them in other groups were also examined. Additionally, tissues of animals with abnormal sign at necropsy were examined histopathologically.

⑰ Bronchoalveolar lavage (BAL)

A BAL was performed on 1 time after termination of exposure to test substance, and 5 animals from control and each exposure group in either the male or female rats, and the right lung of recovery group. The BAL cells were counted with microscopy to take a count of the total cell numbers, macrophages, polymorphonuclear cells (PMNs), and lymphocytes. The albumin, lactate dehydrogenase (LDH), and TP as inflammatory markers in the BAL were also measured using a blood biochemical analyzer (Hitachi 7180, HITACHI, Japan; MAI-059-01).

(5) Statistical analysis

The differences among the vehicle control and the dosing groups were

examined using the parametric multiple comparison procedures or non-parametric multiple comparison procedures. The occurrence rate was converted into percentage. SPSS for Windows version 12.0 software (SPSS, Chicago, IL, U.S.A.) was used for analysis.

① Analysis of continuous data (body weights, food consumption, hematology, blood coagulation time, blood biochemistry, organ weights and BAL analysis)

The statistical treatment was conducted to suppose the normality. The differences among the groups were examined and certificated the equal variance using the standard one-way analysis of variance (ANOVA). If these test showed statistical significance, the data was analyzed using the multiple comparison procedure (If the equal variance was admit, Duncan's test was applied and if the equal variance was not admit, Dunnett's test was applied.) comparing vehicle control group with the other experimental groups.

② Analysis of non-continuous data (urinalysis) : The data was converted by scale conversion and analyzed by Chi-squared analysis.

Specific Gravity		Glucose, Protein, Leukocyte, Ketone, Occult blood, Bilirubin		Nitrite		pH		Urobilinogen	
Data	Scale conversion	Data	Scale conversion	Data	Scale conversion	Data	Scale conversion	Data	Scale conversion
≤1.005	1	-(negative)	0	-(negative)	0	5.0	1	0.2	1
1.010	2	±(trace)	1	+ (positive)	1	5.5	2	1.0	2
1.015	3	1+	2			6.0	3	2.0	3
1.020	4	2+	3			6.5	4		
1.025	5	3+	4			7.0	5		
≥1.030	6					7.5	6		
						8.0	7		
						8.5	8		
						9.0	9		

③ Declaration of statistical results

The statistical results were specified in a mean and standard error (S.E). The diameter of MWCNT was specified in a geometric mean (GM) and geometric standard deviation (GSD).

4. RESULTS

1) Environment for animal exposure chamber (Table 1, Appendix 1)

The temperature, humidity, oxygen, carbon dioxide (CO_2) and pressure for the exposure period were recorded as 22.75 ± 0.10 °C, 47.01 ± 0.38 %, 20.08 ± 0.01 %, 328.32 ± 8.81 ppm, - 291.41 ± 1.37 pascal in Chamber 1 (control), and 22.38 ± 0.08 °C, 46.36 ± 0.43 %, 20.12 ± 0.00 %, 368.58 ± 1.52 ppm, - 293.12 ± 1.43 pascal in Chamber 2 (low dose group). Chamber 3 (middle dose group) was recorded as 22.48 ± 0.08 °C, 52.39 ± 0.52 %, 20.12 ± 0.00 %, 371.60 ± 1.03 ppm, - 294.09 ± 1.36 pascal, and Chamber 4 (high dose group) was recorded as 22.87 ± 0.07 °C, 56.25 ± 0.61 %, 20.16 ± 0.00 %, 348.96 ± 1.45 ppm, - 289.86 ± 1.26 pascal.

2) Distribution of MWCNT in exposure chamber

(Table 2, 3, Figure 2 and Appendix 2, 3)

The mass concentration of test substance was recorded as 0.17 ± 0.0002 mg/m³, 0.51 ± 0.0003 mg/m³, 1.01 ± 0.0080 mg/m³ for low, middle and high dose respectively. The particle number of clean air entering the control chamber was 0.075 ± 0.0300 particles/cc in Channel 1 ($0.3\ \mu\text{m}$) and 0.018 ± 0.0049 particles/cc in Channel 2 ($1.0\ \mu\text{m}$) of the particle sensor.

3) TEM analysis of test substance (Table 4, Figure 3, 4 and Appendix 4)

In the results of TEM analysis, the shape was shown as fiber shape, and the main element was carbon through the analysis of energy dispersive X-ray spectrometer (EDX). Geometric mean (GM) and geometric standard deviation (GSD) of the cumulative median length (CML) were █ nm and █, respectively.

4) Clinical signs (Table 5-1, 5-2, 5-3 and Appendix 5-1, 5-2, 5-3)

① Exposure group

In the results of clinical signs during acclimation and exposure periods, the restlessness and convulsion were observed in the one case of exposure group in the medium dose of male rats at 80 days after exposure, and that animal was excluded in exposure. The day after, that animal was dead. Except for that, there were no abnormal clinical signs and mortalities in either male or female rats of exposure periods.

② Recovery group

There were no mortalities and specific clinical signs in control and recovery

groups in male rats.

5) Body weights (Table 6-1, 6-2, 6-3, Figure 5 and Appendix 6-1, 6-2, 6-3)

There were no significant changes of body weights in each male or female rats during exposure periods and in male rats during recovery periods.

6) Food consumption

(Table 7-1, 7-2, 7-3, Figure 6 and Appendix 7-1, 7-2, 7-3)

There were no significant changes of food consumption in each male or female rats during exposure periods and in male rats during recovery periods.

7) Urinalysis (Table 8-1, 8-2, 8-3 and Appendix 8-1, 8-2, 8-3)

① Exposure group

There were significant difference ($p<0.01$) among groups for value of ketone body and pH in male rats, however there were no significant changes in female rats.

② Recovery group

There were significant difference ($p<0.05$) among for value of occult blood in male rats.

8) Ophthalmoscopy (Table 9-1, 9-2, 9-3 and Appendix 9-1, 9-2, 9-3)

No abnormal lesions were observed in all animals of the control and the high dose group in each male or female rats of exposure groups and in male rats of recovery groups.

9) Necropsy findings (Table 10-1, 10-2, 10-3 and Appendix 10-1, 10-2, 10-3)

① Exposure group

The red exudate in abdominal cavity and red urine in lumen with dilatation were observed in dead animal in the medium dose of male rats. However, there were no observed in specific necropsy findings in survival animals in each male or female rats.

② Recovery group

The small in right testis and epididymis was observed in the one case in the low dose of male rats.

10) Organ weights

(Table 11-1, 11-2, 11-3, 12-1, 12-2, 12-3 and Appendix 11-1, 11-2, 11-3)

① Exposure group

In absolute organ weights, the left lung weight was increased significantly in male rats in the high dose group when compared with the control group ($p<0.05$), however, there were no significant changes of absolute organ weight in female rats.

In relative organ weight, there were no significant changes of relative organ weight in male rat. The right lung weight was decreased significantly in female rats in the low dose group when compared with the control group ($p<0.05$).

② Recovery group

There were no significant changes of absolute organ weight when compared with the control group, however, the liver weight in relative organ weight was decreased significantly in the medium dose group when compared with the high dose group ($p<0.05$).

11) Blood biochemistry (Table 13-1, 13-2, 13-3 and Appendix 12-1, 12-2, 12-3)

① Exposure group

There were no significant changes of blood biochemistry in male rats.

The value of sodium (Na) was increased significantly in female rats in the low, medium and high dose groups when compared with the control group ($p<0.01$), and the value of potassium (K) was increased significantly in the medium and high dose groups when compared with the control group ($p<0.05$).

② Recovery group

The value of cholesterol (CHO) was increased significantly in the low and high dose groups when compared with the medium group ($p<0.05$), and the value of creatinine in the medium dose group when compared with the control, low and high dose groups ($p<0.01$). The value of magnesium (Mg) was decreased significantly in the low and high dose groups when compared with the control group ($p<0.05$).

12) Hematology (Table 14-1, 14-2, 14-3 and Appendix 13-1, 13-2, 13-3)

① Exposure group

The value of hematocrit (HCT) was increased significantly in male rats in the medium dose group when compared with the control and high dose groups ($p<0.05$). However, there were no significant difference of hematology in female rats.

② Recovery group

The value of neutrophil (NE) ($p<0.01$), percentage of neutrophil (NEP) ($p<0.01$) were increased significantly in the medium dose group when compared with the control, low and high dose groups and percentage of lymphocyte (LYP) ($p<0.05$) was decreased significantly in the medium dose group when compared with the control, low and high dose groups.

13) Blood coagulation test

(Table 15-1, 15-2, 15-3 Figure 7 and Appendix 14-1, 14-2, 14-3)

① Exposure group

There were no significant changes in all groups in each male or female rats.

② Recovery group

The value of prothrombin time (PT) was increased significantly in the medium and high dose groups when compared with the control group ($p<0.05$).

14) Histopathology

(Table 16-1, 16-2, 16-3, 16-4 and Appendix 15-1, 15-2, 15-3)

(1) Dead animal

The flattening of urothelial with inflammation was observed in one case in urinary bladder. It was observed in each one case respectively that the congestion of liver and lung, the focal mineralization in tubule in kidney cortex and the edema and hemorrhage with inflammation in interstitial in prostate.

(2) Animals with gross findings

① Exposure group

There were no observed in remarkable lesions in each male or female rats.

② Recovery group

The unilateral atrophy of seminiferous tubule was observed in one case in small right testis in the low dose group. The hypoplasia and degeneration in epididymal duct and the decreased spermatozoa in lumen were observed in one case respectively in small epididymis in the low dose group.

(3) Lung and nasal cavity

① Exposure group

There were observed to the one case with the inflammation with focal fibrosis and with the alveolar macrophage in the medium dose group of male rats respectively. And the hemorrhage was observed in the high dose group

in male rats. However, there were no observed in remarkable lesions in nasal cavity.

There were no observed in remarkable lesions in lung and nasal cavity in female rats.

② Recovery group

The focal alveolar macrophage in lung was observed in two cases in the medium dose group, and there were no observed in remarkable lesions in nasal cavity.

(4) Other organs and tissues

① Exposure group

In male rats, there were observed to the two cases with focal basophilic tubule in cortex of kidney in the control and high dose groups respectively. And the two cases of cyst in pars intermedia and one case of the suppurative inflammation in prostate were observed in the control group respectively.

In female rats, there was observed to one case with cyst in pars intermedia in the control group. There were observed to one case with focal degeneration and necrosis in liver and focal mononuclear cell infiltration in harderian gland in the high dose group respectively.

② Recovery group

There were observed to the five cases with focal basophilic tubule in cortex of kidney in the control and high dose groups respectively. The hyaline droplet in inner stripe and cortex of kidney and the mononuclear cell infiltration in perivascular were observed in each one case respectively in the high dose group. The focal lymphocytic cell infiltration in harderian gland was observed in one case in the control group.

15) Broncholaveolar lavage

(Table 17-1, 17-2, 17-3, Figure 8, 9 and Appendix 16-1, 16-2, 16-3)

There were no significant changes in test item of cell examination and inflammatory parameter of BAL fluid of exposure and recovery groups in each male or female rats.

5. DISCUSSION AND CONCLUSION

This study was performed to evaluate subchronic inhalation toxicity of multi-wall carbon nanotube (MWCNT) using specific pathogen free (SPF) – Fisher 344 (F344) rats with the concentration of 0, 0.17 (low-dose group), 0.51 (middle-dose group) and 1.01 (high-dose group) mg/m³. The rats were exposed to test substance for 6 hours/day, 5 days/week during 13 weeks in nose-only inhalation chamber. Grouping consisted of 15 male and 10 female rats in each group. Test method conformed to Guideline for the Testing of Chemical Hazards, National Institute of Environment Research (NIER)[Notice No. 2013-2 (revised 9th, Jan., 2013)] and OECD Guideline for Testing of Chemicals No. 413 'Subchronic Inhalation Toxicity' (Adopted 7th Sep, 2009).

The environment and concentration of MWCNT for animal exposure chamber were measured during exposure periods. Mortalities, clinical signs, body weight and food consumption changes were evaluated in exposure periods, and necropsy, organ weight, hematology, blood biochemistry, blood coagulation time, bronchoalveolar lavage (BAL), and histopathological test, were conducted after exposure the test substance in exposure and recovery groups. The results were as follows,

The temperature, humidity, oxygen, carbon dioxide (CO₂) and pressure for the exposure period were recorded as 22.75±0.10 °C, 47.01±0.38 %, 20.08±0.01 %, 328.32±8.81 ppm, -291.41±1.37 pascal in Chamber 1 (control), and 22.38±0.08 °C, 46.36±0.43 %, 20.12±0.00 %, 368.58±1.52 ppm, -293.12±1.43 pascal in Chamber 2 (low dose group). Chamber 3 (middle dose group) was recorded as 22.48±0.08 °C, 52.39±0.52 %, 20.12±0.00 %, 371.60±1.03 ppm, -294.09±1.36 pascal, and Chamber 4 (high dose group) was recorded as 22.87±0.07 °C, 56.25±0.61 %, 20.16±0.00 %, 348.96±1.45 ppm, -289.86±1.26 pascal.

The mass concentration of test substance was recorded as 0.17±0.0002 mg/m³, 0.51±0.0003 mg/m³, 1.01±0.0080 mg/m³ for low, middle and high dose respectively. The particle number of clean air entering the control chamber was 0.075±0.0300 particles/cc in Channel 1 (0.3 μm) and 0.018±0.0005 particles/cc in Channel 2 (1.0 μm) of the particle sensor.

The results of TEM analysis, the shape was shown as fiber shape, and the main element was carbon through the analysis of energy dispersive X-ray

spectrometer (EDX). Geometric mean (GM) and geometric standard deviation (GSD) of the cumulative median length (CML) were █ nm and █ respectively.

In the results of clinical signs during acclimation, exposure periods and recovery periods, the restlessness and convulsion were observed in the one case of exposure group in the medium dose of male rats at 80 days after exposure, and that animal was excluded in exposure. The day after, that animal was dead. Except for that, there were no abnormal clinical signs and mortalities in either male or female rats of exposure periods and in male rats during recovery periods.

There was no significant difference in body weight change between control and exposure groups in either male or female rats of exposure and recovery periods.

The changes of food consumption in the exposure and recovery periods were not statistically dose-dependant, and it was considered that test substance was not influenced the food consumption.

Ophthalmologic examination was unremarkable in all rats and there were no statistically significant specific sings relating to the test substance in control and high dose groups in either male or female rats of exposure and recovery groups respectively.

In urinalysis, there were observed to the statistical significance in the value of KET ($p<0.05$) and pH ($p<0.05$) among the control group and exposure groups in male rats of exposure group, but these were considered that test substance was not influenced the changes of urinalysis, because the remarkable lesions were not observed in histopathological examination of kidney. Except for that, there were no statistical difference in other test items in each male or female rats of exposure group. There were observed to the statistical significance in the value of occult blood ($p<0.05$) among the control group and exposure groups in male rats of recovery group, but it was not considered to be toxicological effects, because the detection frequency in the recovery control group was observed relatively more high than other groups.

There were showed the red exudate in abdominal cavity and the dilatation of urinary bladder with red urin in lunmen of dead animal in the male rats in the medium dose exposure group at 81 days after exposure to the test substance. However, it was the solitary view in the one case of the medium group, and it was considered to relate with test substance. The small in right testis and epididymis was observed in the one case in the low dose in male rats of the recovery group. However considering of histopathological examination, it was the solitary view in the one case of the low group of recovery group, and it was not considered to be toxicological effect. Except for that, there were no gross abnormalities in each male or female rats of exposure and recovery group.

In the results of organ weights, the absolute weight of left lung increased significantly ($p<0.05$) in male rats in the high dose exposure group when compared with the control group, and the relative weight of right lung decreased significantly ($p<0.05$) in female rats in the low dose exposure group when compared with the control group. However, these values were comprised in physiological normal range and were not statistically dose-dependant, and it was considered that test substance was not influenced the change of organ weights. Except for that, there were no statistical difference in other organs in each male or female rats in exposure group. The relative weight of liver decreased significantly ($p<0.05$) in male rats in the medium dose recovery group when compared with the high dose group, but this value was not statistically dose-dependant, and it was considered that test substance was not influenced the change of organ weight.

In the results of blood biochemistry, the low, medium and high dose group revealed significantly increased sodium ($p<0.05$) in the female rats when compared with the control, the value of potassium ($p<0.05$) in the medium and high dose group was increased significantly when compared with the control group in the female rats. However, these values were comprised in physiological normal range and were not observed to the remarkable lesions of kidney in the histopathological examination, and it was considered that test substance was not influenced in the blood biochemistry. Except for that, there were no statistical difference in other test items in each male or female rats of exposure and recovery group.

In the result of hematology, the value of hematocrit ($p<0.05$) in medium dose

group increased significantly when compared with the male rats in the control group of exposure group. However, these values were not statistically dose-dependant, and it was considered that test substance was not influenced the change of hematology. Except for that, there were no statistical difference in other test items in each male or female rats of exposure group. And, the value of creatinine ($p<0.01$) in the medium dose group and the value of magnesium ($p<0.05$) in the low and high dose group were showed the significant difference when compared with the control group in recovery group. However, these values were not statistically dose-dependant and were not showed in the exposure group, and it was not considered to be toxicological effect.

In the results of blood coagulation time, there were no significant differences related with the test substance for all treated groups of exposure group. And, the value of prothrombin time ($p<0.05$) increased significantly when compared with the male rats in control group of recovery group. However, these values were not statistically dose-dependant and were not showed in the exposure group, and it was not considered to be toxicological effect.

In histopathological examination of dead animal in male medium exposure group, urothelial flattening with inflammation was observed and it is correlated with expanded bladder. Also, in the other collected organs, histopathological abnormality was found. There were congestion in the liver and lung, focal tubular mineralization in renal cortex, edema/hemorrhage with inflammation in prostate interstitium. The day before death, the animals had anxiety, tremor and stupor. And observed gross findings, red exudate in abdominal cavity and red urine in the bladder, presumed to be derived from blood. In general, the test animals are estimated to be up to death in order to accidental trauma that occurred during exposure of test substance in nose-only inhalation chamber. So, it is not considered to relate with test substance.

In scheduled necropsy low recovery groups, right testis and epididymis became smaller in medium recovery group. It correlated with unilateral seminiferous atrophy, hypoplasia/degeneration of epididymal duct, and decreased spermatozoa in lumen. It is also not considered to relate with test substance, which was a only one lesion at low exposure group.

In histopathological examination of the lungs and nasal cavity of control and exposure groups: alveolar inflammation with fibrosis, hemorrhage, and alveolar macrophage were observed in solitary in male medium and high exposure

groups. But, it is not considered to be toxicological effects, because lesion was considered to be spontaneous with no concentration independency. And, in histopathological examination of the lungs and nasal cavity of male recovery control and exposure group: local alveolar macrophages were observed in 2 male rats of medium concentration group. However, it is not considered to be toxicological effect as spontaneous lesion which is not showing concentration dependency. Moreover, there is no remarkable lesions on nasal cavity in male recovery groups.

The rest, focal degeneration/necrosis in liver, focal basophilic tubule, focal cortex in renal cortex, focal monocellular cell infiltration in harderian gland, cyst in pars intermedia of pituitary, suppurative inflammation in prostate, and etc were sporadically observed in control and exposure groups. That was observed in control group, or their incident rate was similar to that of the control group. That lesion is considered to be spontaneous and appeared at once. In conclusion, it is not considered to be toxicological effect.

From male recovery control and high exposure group all objects has focal basophilic tubules in renal cortex. Perivascular mononuclear cell infiltration or hyaline droplet in inner stripe or cortex has been accompanied in some individuals as well. Also, focal lymphocytic cell infiltration was observed in harderian gland of male recovery control group. But, histopathological abnormality of the kidney was minimal and presumed spontaneously in both the control and exposure group following by aging (scheduled sacrifice at 34 weeks old). And, abnormality in harderian gland has no toxicological meaning because it was only one lesion in control group.

In BAL test, these values were not statistically dose-dependant, and it was considered that test substance was not influenced the change of BAL test.

In conclusion, NOAEL (no observed adverse effect level) value for the inhalation toxicity of MWCNT is considered to be 1.01 mg/m³ and the target organ was not observed with considering of the each test items and histopathological examination in this study.

6. REFERENCES

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7. TABLE

Table 1. Environment of animal exposure chamber

ENVIRONMENT OF ANIMAL EXPOSURE CHAMBER					
STUDY ID : GT14-00042					Mean ± S.E
Group	Temperature (°C)	Humidity (%)	O ₂ (%)	CO ₂ (ppm)	Pressure (pascal)
Control	22.75 ± 0.10	47.01 ± 0.38	20.08 ± 0.01	328.32 ± 8.81	-291.41 ± 1.37
Low	22.38 ± 0.08	46.36 ± 0.43	20.12 ± 0.00	368.58 ± 1.52	-293.12 ± 1.43
Medium	22.48 ± 0.08	52.39 ± 0.52	20.12 ± 0.00	371.60 ± 1.03	-294.09 ± 1.36
High	22.87 ± 0.07	56.25 ± 0.61	20.16 ± 0.00	348.96 ± 1.45	-289.86 ± 1.26

Table 2. Concentration of MWCNT

CONCENTRATION OF ANIMAL EXPOSURE CHAMBER		
STUDY ID : GT14-00042		Mean ± S.E
Group	Target Conc.	Mass (mg/m ³)
Control	0	0.00±0.00
Low	0.2 mg/m ³ (0.14~0.26)	0.17±0.0002
Medium	0.5 mg/m ³ (0.35~0.65)	0.51±0.0003
High	1.0 mg/m ³ (0.7~1.3)	1.01±0.0080

Table 3. Distribution of particle in vehicle

DISTRIBUTION OF PARTICLE IN VEHICLE			
STUDY ID : GT14-00042			mean±S.E
0.3μm/min	1.0μm/min	0.3 particles/cc	1.0 particles/cc
211.00 ± 84.79 (68)	50.56 ± 13.95 (68)	0.075 ± 0.0300 (68)	0.018 ± 0.0049 (68)

Table 4. The length of MWCNT

THE LENGTH OF MWCNT		

Table 5-1. Clinical signs of male rats in exposure group

CLINICAL SIGNS SUMMARY EXPOSURE 13WEEKS					
STUDY ID : GT14-00042			SEX: MALE		
Day	SIGN	Control	Group		
			Low	Medium	High
0	Normal	15/15	15/15	15/15	15/15
1	Normal	15/15	15/15	15/15	15/15
2	Normal	15/15	15/15	15/15	15/15
3	Normal	15/15	15/15	15/15	15/15
4	Normal	15/15	15/15	15/15	15/15
5	Normal	15/15	15/15	15/15	15/15
6	Normal	15/15	15/15	15/15	15/15
7	Normal	15/15	15/15	15/15	15/15
8	Normal	15/15	15/15	15/15	15/15
9	Normal	15/15	15/15	15/15	15/15
10	Normal	15/15	15/15	15/15	15/15
11	Normal	15/15	15/15	15/15	15/15
12	Normal	15/15	15/15	15/15	15/15
13	Normal	15/15	15/15	15/15	15/15
14	Normal	15/15	15/15	15/15	15/15
15	Normal	15/15	15/15	15/15	15/15
16	Normal	15/15	15/15	15/15	15/15
17	Normal	15/15	15/15	15/15	15/15
18	Normal	15/15	15/15	15/15	15/15
19	Normal	15/15	15/15	15/15	15/15
20	Normal	15/15	15/15	15/15	15/15

Table 5-1. Clinical signs of male rats in exposure group (continued)

CLINICAL SIGNS SUMMARY EXPOSURE 13WEEKS					
STUDY ID : GT14-00042			SEX: MALE		
Day	SIGN		Group		
		Control	Low	Medium	High
21	Normal	15/15	15/15	15/15	15/15
22	Normal	15/15	15/15	15/15	15/15
23	Normal	15/15	15/15	15/15	15/15
24	Normal	15/15	15/15	15/15	15/15
25	Normal	15/15	15/15	15/15	15/15
26	Normal	15/15	15/15	15/15	15/15
27	Normal	15/15	15/15	15/15	15/15
28	Normal	15/15	15/15	15/15	15/15
29	Normal	15/15	15/15	15/15	15/15
30	Normal	15/15	15/15	15/15	15/15
31	Normal	15/15	15/15	15/15	15/15
32	Normal	15/15	15/15	15/15	15/15
33	Normal	15/15	15/15	15/15	15/15
34	Normal	15/15	15/15	15/15	15/15
35	Normal	15/15	15/15	15/15	15/15
36	Normal	15/15	15/15	15/15	15/15
37	Normal	15/15	15/15	15/15	15/15
38	Normal	15/15	15/15	15/15	15/15
39	Normal	15/15	15/15	15/15	15/15
40	Normal	15/15	15/15	15/15	15/15
41	Normal	15/15	15/15	15/15	15/15

Table 5-1. Clinical signs of male rats in exposure group (continued)

CLINICAL SIGNS SUMMARY EXPOSURE 13WEEKS					
STUDY ID : GT14-00042			SEX: MALE		
Day	SIGN	Control	Group		
			Low	Medium	High
42	Normal	15/15	15/15	15/15	15/15
43	Normal	15/15	15/15	15/15	15/15
44	Normal	15/15	15/15	15/15	15/15
45	Normal	15/15	15/15	15/15	15/15
46	Normal	15/15	15/15	15/15	15/15
47	Normal	15/15	15/15	15/15	15/15
48	Normal	15/15	15/15	15/15	15/15
49	Normal	15/15	15/15	15/15	15/15
50	Normal	15/15	15/15	15/15	15/15
51	Normal	15/15	15/15	15/15	15/15
52	Normal	15/15	15/15	15/15	15/15
53	Normal	15/15	15/15	15/15	15/15
54	Normal	15/15	15/15	15/15	15/15
55	Normal	15/15	15/15	15/15	15/15
56	Normal	15/15	15/15	15/15	15/15
57	Normal	15/15	15/15	15/15	15/15
58	Normal	15/15	15/15	15/15	15/15
59	Normal	15/15	15/15	15/15	15/15
60	Normal	15/15	15/15	15/15	15/15
61	Normal	15/15	15/15	15/15	15/15
62	Normal	15/15	15/15	15/15	15/15

Table 5-1. Clinical signs of male rats in exposure group (continued)

CLINICAL SIGNS SUMMARY EXPOSURE 13WEEKS						
STUDY ID : GT14-00042			SEX: MALE			
Day	SIGN		Group			
			Control	Low	Medium	High
63	Normal		15/15	15/15	15/15	15/15
64	Normal		15/15	15/15	15/15	15/15
65	Normal		15/15	15/15	15/15	15/15
66	Normal		15/15	15/15	15/15	15/15
67	Normal		15/15	15/15	15/15	15/15
68	Normal		15/15	15/15	15/15	15/15
69	Normal		15/15	15/15	15/15	15/15
70	Normal		15/15	15/15	15/15	15/15
71	Normal		15/15	15/15	15/15	15/15
72	Normal		15/15	15/15	15/15	15/15
73	Normal		15/15	15/15	15/15	15/15
74	Normal		15/15	15/15	15/15	15/15
75	Normal		15/15	15/15	15/15	15/15
76	Normal		15/15	15/15	15/15	15/15
77	Normal		15/15	15/15	15/15	15/15
78	Normal		15/15	15/15	15/15	15/15
79	Normal		15/15	15/15	15/15	15/15
80	Normal		15/15	15/15	14/15	15/15
	Abnormal		0/15	0/15	1/15 ^a	0/15
81	Normal		15/15	15/15	14/15	15/15
	Abnormal		0/15	0/15	1/15 ^b	0/15
82	Normal		15/15	15/15	14/15	15/15
	Abnormal		0/15	0/15	1/15 ^b	0/15
83	Normal		15/15	15/15	14/15	15/15
	Abnormal		0/15	0/15	1/15 ^b	0/15

a : restlessness, convulsion, stupor

b : death

Table 5-1. Clinical signs of male rats in exposure group (continued)

CLINICAL SIGNS SUMMARY EXPOSURE 13WEEKS					
STUDY ID : GT14-00042		SEX: MALE			
Day	SIGN	Group			
		Control	Low	Medium	High
84	Normal	15/15	15/15	14/15	15/15
	Abnormal	0/15	0/15	1/15 ^a	0/15
85	Normal	15/15	15/15	14/15	15/15
	Abnormal	0/15	0/15	1/15 ^a	0/15
86	Normal	15/15	15/15	14/15	15/15
	Abnormal	0/15	0/15	1/15 ^a	0/15
87	Normal	15/15	15/15	14/15	15/15
	Abnormal	0/15	0/15	1/15 ^a	0/15
88	Normal	15/15	15/15	14/15	15/15
	Abnormal	0/15	0/15	1/15 ^a	0/15
89	Normal	15/15	15/15	14/15	15/15
	Abnormal	0/15	0/15	1/15 ^a	0/15
90	Normal	15/15	15/15	14/15	15/15
	Abnormal	0/15	0/15	1/15 ^a	0/15
91	Normal	15/15	15/15	14/15	15/15
	Abnormal	0/15	0/15	1/15 ^a	0/15
92	Normal	15/15	15/15	14/15	15/15
	Abnormal	0/15	0/15	1/15 ^a	0/15

a : death

Table 5-2. Clinical signs of female rats in exposure group

CLINICAL SIGNS SUMMARY EXPOSURE 13WEEKS						
STUDY ID : GT14-00042		SEX: FEMALE				
Day	SIGN	Control	Group	Low	Medium	High
0	Normal	10/10		10/10	10/10	10/10
1	Normal	10/10		10/10	10/10	10/10
2	Normal	10/10		10/10	10/10	10/10
3	Normal	10/10		10/10	10/10	10/10
4	Normal	10/10		10/10	10/10	10/10
5	Normal	10/10		10/10	10/10	10/10
6	Normal	10/10		10/10	10/10	10/10
7	Normal	10/10		10/10	10/10	10/10
8	Normal	10/10		10/10	10/10	10/10
9	Normal	10/10		10/10	10/10	10/10
10	Normal	10/10		10/10	10/10	10/10
11	Normal	10/10		10/10	10/10	10/10
12	Normal	10/10		10/10	10/10	10/10
13	Normal	10/10		10/10	10/10	10/10
14	Normal	10/10		10/10	10/10	10/10
15	Normal	10/10		10/10	10/10	10/10
16	Normal	10/10		10/10	10/10	10/10
17	Normal	10/10		10/10	10/10	10/10
18	Normal	10/10		10/10	10/10	10/10
19	Normal	10/10		10/10	10/10	10/10
20	Normal	10/10		10/10	10/10	10/10

Table 5-2. Clinical signs of female rats in exposure group (continued)

CLINICAL SIGNS SUMMARY					
EXPOSURE 13WEEKS					
STUDY ID : GT14-00042		SEX: FEMALE			
Day	SIGN	Group			
		Control	Low	Medium	High
21	Normal	10/10	10/10	10/10	10/10
22	Normal	10/10	10/10	10/10	10/10
23	Normal	10/10	10/10	10/10	10/10
24	Normal	10/10	10/10	10/10	10/10
25	Normal	10/10	10/10	10/10	10/10
26	Normal	10/10	10/10	10/10	10/10
27	Normal	10/10	10/10	10/10	10/10
28	Normal	10/10	10/10	10/10	10/10
29	Normal	10/10	10/10	10/10	10/10
30	Normal	10/10	10/10	10/10	10/10
31	Normal	10/10	10/10	10/10	10/10
32	Normal	10/10	10/10	10/10	10/10
33	Normal	10/10	10/10	10/10	10/10
34	Normal	10/10	10/10	10/10	10/10
35	Normal	10/10	10/10	10/10	10/10
36	Normal	10/10	10/10	10/10	10/10
37	Normal	10/10	10/10	10/10	10/10
38	Normal	10/10	10/10	10/10	10/10
39	Normal	10/10	10/10	10/10	10/10
40	Normal	10/10	10/10	10/10	10/10
41	Normal	10/10	10/10	10/10	10/10

Table 5-2. Clinical signs of female rats in exposure group (continued)

CLINICAL SIGNS SUMMARY					
EXPOSURE 13WEEKS					
STUDY ID : GT14-00042		SEX: FEMALE			
Day	SIGN	Group			
		Control	Low	Medium	High
42	Normal	10/10	10/10	10/10	10/10
43	Normal	10/10	10/10	10/10	10/10
44	Normal	10/10	10/10	10/10	10/10
45	Normal	10/10	10/10	10/10	10/10
46	Normal	10/10	10/10	10/10	10/10
47	Normal	10/10	10/10	10/10	10/10
48	Normal	10/10	10/10	10/10	10/10
49	Normal	10/10	10/10	10/10	10/10
50	Normal	10/10	10/10	10/10	10/10
51	Normal	10/10	10/10	10/10	10/10
52	Normal	10/10	10/10	10/10	10/10
53	Normal	10/10	10/10	10/10	10/10
54	Normal	10/10	10/10	10/10	10/10
55	Normal	10/10	10/10	10/10	10/10
56	Normal	10/10	10/10	10/10	10/10
57	Normal	10/10	10/10	10/10	10/10
58	Normal	10/10	10/10	10/10	10/10
59	Normal	10/10	10/10	10/10	10/10
60	Normal	10/10	10/10	10/10	10/10
61	Normal	10/10	10/10	10/10	10/10
62	Normal	10/10	10/10	10/10	10/10

Table 5-2. Clinical signs of female rats in exposure group (continued)

CLINICAL SIGNS SUMMARY					
EXPOSURE 13WEEKS					
STUDY ID : GT14-00042		SEX: FEMALE			
Day	SIGN	Group			
		Control	Low	Medium	High
63	Normal	10/10	10/10	10/10	10/10
64	Normal	10/10	10/10	10/10	10/10
65	Normal	10/10	10/10	10/10	10/10
66	Normal	10/10	10/10	10/10	10/10
67	Normal	10/10	10/10	10/10	10/10
68	Normal	10/10	10/10	10/10	10/10
69	Normal	10/10	10/10	10/10	10/10
70	Normal	10/10	10/10	10/10	10/10
71	Normal	10/10	10/10	10/10	10/10
72	Normal	10/10	10/10	10/10	10/10
73	Normal	10/10	10/10	10/10	10/10
74	Normal	10/10	10/10	10/10	10/10
75	Normal	10/10	10/10	10/10	10/10
76	Normal	10/10	10/10	10/10	10/10
77	Normal	10/10	10/10	10/10	10/10
78	Normal	10/10	10/10	10/10	10/10
79	Normal	10/10	10/10	10/10	10/10
80	Normal	10/10	10/10	10/10	10/10
81	Normal	10/10	10/10	10/10	10/10
82	Normal	10/10	10/10	10/10	10/10
83	Normal	10/10	10/10	10/10	10/10

Table 5-2. Clinical signs of female rats in exposure group (continued)

CLINICAL SIGNS SUMMARY EXPOSURE 13WEEKS						
STUDY ID : GT14-00042		SEX: FEMALE				
Day	SIGN	Control	Group	Low	Medium	High
84	Normal	10/10		10/10	10/10	10/10
85	Normal	10/10		10/10	10/10	10/10
86	Normal	10/10		10/10	10/10	10/10
87	Normal	10/10		10/10	10/10	10/10
88	Normal	10/10		10/10	10/10	10/10
89	Normal	10/10		10/10	10/10	10/10
90	Normal	10/10		10/10	10/10	10/10
91	Normal	10/10		10/10	10/10	10/10
92	Normal	10/10		10/10	10/10	10/10

Table 5-3. Clinical signs of male rats in recovery group

CLINICAL SIGNS SUMMARY					
RECOVERY 13WEEKS					
STUDY ID : GT14-00042			SEX: MALE		
Day	SIGN	Control	Group		
			Low	Medium	High
1	Normal	5/5	5/5	5/5	5/5
2	Normal	5/5	5/5	5/5	5/5
3	Normal	5/5	5/5	5/5	5/5
4	Normal	5/5	5/5	5/5	5/5
5	Normal	5/5	5/5	5/5	5/5
6	Normal	5/5	5/5	5/5	5/5
7	Normal	5/5	5/5	5/5	5/5
8	Normal	5/5	5/5	5/5	5/5
9	Normal	5/5	5/5	5/5	5/5
10	Normal	5/5	5/5	5/5	5/5
11	Normal	5/5	5/5	5/5	5/5
12	Normal	5/5	5/5	5/5	5/5
13	Normal	5/5	5/5	5/5	5/5
14	Normal	5/5	5/5	5/5	5/5
15	Normal	5/5	5/5	5/5	5/5
16	Normal	5/5	5/5	5/5	5/5
17	Normal	5/5	5/5	5/5	5/5
18	Normal	5/5	5/5	5/5	5/5
19	Normal	5/5	5/5	5/5	5/5
20	Normal	5/5	5/5	5/5	5/5

Table 5-3. Clinical signs of male rats in recovery group (continued)

CLINICAL SIGNS SUMMARY					
RECOVERY 13WEEKS					
STUDY ID : GT14-00042			SEX: MALE		
Day	SIGN	Control	Group		
			Low	Medium	High
21	Normal	5/5	5/5	5/5	5/5
22	Normal	5/5	5/5	5/5	5/5
23	Normal	5/5	5/5	5/5	5/5
24	Normal	5/5	5/5	5/5	5/5
25	Normal	5/5	5/5	5/5	5/5
26	Normal	5/5	5/5	5/5	5/5
27	Normal	5/5	5/5	5/5	5/5
28	Normal	5/5	5/5	5/5	5/5
29	Normal	5/5	5/5	5/5	5/5
30	Normal	5/5	5/5	5/5	5/5
31	Normal	5/5	5/5	5/5	5/5
32	Normal	5/5	5/5	5/5	5/5
33	Normal	5/5	5/5	5/5	5/5
34	Normal	5/5	5/5	5/5	5/5
35	Normal	5/5	5/5	5/5	5/5
36	Normal	5/5	5/5	5/5	5/5
37	Normal	5/5	5/5	5/5	5/5
38	Normal	5/5	5/5	5/5	5/5
39	Normal	5/5	5/5	5/5	5/5
40	Normal	5/5	5/5	5/5	5/5
41	Normal	5/5	5/5	5/5	5/5

Table 5-3. Clinical signs of male rats in recovery group (continued)

CLINICAL SIGNS SUMMARY					
RECOVERY 13WEEKS					
STUDY ID : GT14-00042			SEX: MALE		
Day	SIGN	Control	Group		
			Low	Medium	High
42	Normal	5/5	5/5	5/5	5/5
43	Normal	5/5	5/5	5/5	5/5
44	Normal	5/5	5/5	5/5	5/5
45	Normal	5/5	5/5	5/5	5/5
46	Normal	5/5	5/5	5/5	5/5
47	Normal	5/5	5/5	5/5	5/5
48	Normal	5/5	5/5	5/5	5/5
49	Normal	5/5	5/5	5/5	5/5
50	Normal	5/5	5/5	5/5	5/5
51	Normal	5/5	5/5	5/5	5/5
52	Normal	5/5	5/5	5/5	5/5
53	Normal	5/5	5/5	5/5	5/5
54	Normal	5/5	5/5	5/5	5/5
55	Normal	5/5	5/5	5/5	5/5
56	Normal	5/5	5/5	5/5	5/5
57	Normal	5/5	5/5	5/5	5/5
58	Normal	5/5	5/5	5/5	5/5
59	Normal	5/5	5/5	5/5	5/5
60	Normal	5/5	5/5	5/5	5/5
61	Normal	5/5	5/5	5/5	5/5
62	Normal	5/5	5/5	5/5	5/5

Table 5-3. Clinical signs of male rats in recovery group (continued)

CLINICAL SIGNS SUMMARY					
RECOVERY 13WEEKS					
STUDY ID : GT14-00042			SEX: MALE		
Day	SIGN	Control	Group		
			Low	Medium	High
63	Normal	5/5	5/5	5/5	5/5
64	Normal	5/5	5/5	5/5	5/5
65	Normal	5/5	5/5	5/5	5/5
66	Normal	5/5	5/5	5/5	5/5
67	Normal	5/5	5/5	5/5	5/5
68	Normal	5/5	5/5	5/5	5/5
69	Normal	5/5	5/5	5/5	5/5
70	Normal	5/5	5/5	5/5	5/5
71	Normal	5/5	5/5	5/5	5/5
72	Normal	5/5	5/5	5/5	5/5
73	Normal	5/5	5/5	5/5	5/5
74	Normal	5/5	5/5	5/5	5/5
75	Normal	5/5	5/5	5/5	5/5
76	Normal	5/5	5/5	5/5	5/5
77	Normal	5/5	5/5	5/5	5/5
78	Normal	5/5	5/5	5/5	5/5
79	Normal	5/5	5/5	5/5	5/5
80	Normal	5/5	5/5	5/5	5/5
81	Normal	5/5	5/5	5/5	5/5
82	Normal	5/5	5/5	5/5	5/5
83	Normal	5/5	5/5	5/5	5/5

Table 5-3. Clinical signs of male rats in recovery group (continued)

CLINICAL SIGNS SUMMARY					
RECOVERY 13WEEKS					
STUDY ID : GT14-00042		SEX: MALE			
Day	SIGN	Control	Group Low	Group Medium	Group High
84	Normal	5/5	5/5	5/5	5/5
85	Normal	5/5	5/5	5/5	5/5
86	Normal	5/5	5/5	5/5	5/5
87	Normal	5/5	5/5	5/5	5/5
88	Normal	5/5	5/5	5/5	5/5
89	Normal	5/5	5/5	5/5	5/5
90	Normal	5/5	5/5	5/5	5/5
91	Normal	5/5	5/5	5/5	5/5
92	Normal	5/5	5/5	5/5	5/5

Table 6-1. Body weights of male rats in exposure group

SUMMARY OF BODY WEIGHTS					
EXPOSURE 13WEEKS					
STUDY ID : GT14-00042		UNIT : g		SEX : MALE	
GROUP: (mean±S.E)	Control	Low	Medium	High	
0 DAY	146.60 ± 1.95 (15)	146.64 ± 1.95 (15)	146.66 ± 1.91 (15)	146.70 ± 1.88 (15)	
1 Week	159.17 ± 2.03 (15)	159.33 ± 1.88 (15)	159.59 ± 2.01 (15)	159.97 ± 2.11 (15)	
2 Week	184.08 ± 2.74 (15)	185.92 ± 2.03 (15)	186.66 ± 2.29 (15)	184.86 ± 3.06 (15)	
3 Week	203.01 ± 2.86 (15)	205.89 ± 1.98 (15)	204.51 ± 2.91 (15)	202.93 ± 3.48 (15)	
4 Week	219.80 ± 2.48 (15)	222.27 ± 2.25 (15)	219.56 ± 3.31 (15)	219.01 ± 3.63 (15)	
5 Week	235.50 ± 2.56 (15)	235.92 ± 3.17 (15)	234.53 ± 3.69 (15)	235.77 ± 4.07 (15)	
6 Week	249.02 ± 2.59 (15)	250.80 ± 3.43 (15)	248.95 ± 3.62 (15)	248.76 ± 4.04 (15)	
7 Week	258.02 ± 2.53 (15)	257.78 ± 3.56 (15)	257.60 ± 4.33 (15)	257.80 ± 3.95 (15)	
8 Week	269.82 ± 2.81 (15)	269.85 ± 2.94 (15)	265.88 ± 3.72 (15)	268.10 ± 4.03 (15)	
9 Week	279.91 ± 3.32 (15)	278.91 ± 2.90 (15)	273.87 ± 3.90 (15)	276.44 ± 4.28 (15)	
10 Week	289.77 ± 3.29 (15)	288.21 ± 3.33 (15)	280.97 ± 4.36 (15)	285.72 ± 4.59 (15)	
11 Week	292.52 ± 3.20 (15)	292.01 ± 3.69 (15)	284.21 ± 3.95 (15)	289.68 ± 4.21 (15)	
12 Week	295.64 ± 3.98 (15)	298.42 ± 3.93 (15)	289.60 ± 4.96 (14)	296.14 ± 4.13 (15)	
13 Week	300.81 ± 3.43 (15)	303.90 ± 4.07 (15)	293.30 ± 4.68 (14)	299.74 ± 4.05 (15)	
Sacrifice	276.88 ± 4.28 (10)	281.73 ± 5.24 (10)	272.28 ± 4.83 (9)	279.10 ± 6.10 (10)	

() : animal number

Table 6-2. Body weights of female rats in exposure group

SUMMARY OF BODY WEIGHTS EXPOSURE 13WEEKS								
STUDY ID : GT14-00042		UNIT : g			SEX : FEMALE			
GROUP: (mean±S.E)	Control	Low	Medium	High				
0 DAY	136.21 ± 1.93 (10)	136.70 ± 1.56 (10)	136.66 ± 1.53 (10)	136.63 ± 1.49 (10)				
1 Week	139.16 ± 1.27 (10)	139.37 ± 1.86 (10)	139.79 ± 1.82 (10)	138.00 ± 1.53 (10)				
2 Week	145.95 ± 1.59 (10)	146.50 ± 2.60 (10)	146.37 ± 2.47 (10)	145.17 ± 1.97 (10)				
3 Week	149.95 ± 1.82 (10)	149.78 ± 3.03 (10)	149.27 ± 2.20 (10)	149.72 ± 2.03 (10)				
4 Week	152.24 ± 1.57 (10)	151.78 ± 3.41 (10)	151.83 ± 2.65 (10)	153.61 ± 2.11 (10)				
5 Week	156.40 ± 1.90 (10)	156.23 ± 3.49 (10)	156.01 ± 2.67 (10)	157.50 ± 2.05 (10)				
6 Week	156.32 ± 2.00 (10)	159.08 ± 3.75 (10)	157.68 ± 2.93 (10)	157.65 ± 1.97 (10)				
7 Week	159.87 ± 2.06 (10)	162.35 ± 4.32 (10)	160.64 ± 3.52 (10)	161.20 ± 2.15 (10)				
8 Week	162.90 ± 2.05 (10)	167.05 ± 4.22 (10)	165.00 ± 3.28 (10)	165.27 ± 2.20 (10)				
9 Week	169.94 ± 2.81 (10)	170.14 ± 4.60 (10)	168.89 ± 3.73 (10)	169.82 ± 2.66 (10)				
10 Week	169.50 ± 2.97 (10)	173.42 ± 4.92 (10)	171.63 ± 3.70 (10)	171.93 ± 2.80 (10)				
11 Week	169.05 ± 3.11 (10)	173.57 ± 4.38 (10)	173.16 ± 3.57 (10)	172.68 ± 2.43 (10)				
12 Week	172.00 ± 3.02 (10)	176.12 ± 4.64 (10)	175.55 ± 3.72 (10)	174.28 ± 2.88 (10)				
13 Week	172.09 ± 3.04 (10)	176.69 ± 4.76 (10)	176.45 ± 3.90 (10)	175.82 ± 3.17 (10)				
Sacrifice	156.27 ± 2.93 (10)	161.12 ± 4.84 (10)	160.62 ± 3.51 (10)	160.21 ± 3.04 (10)				

() : animal number

Table 6-3. Body weights of male rats in recovery group

SUMMARY OF BODY WEIGHTS								
RECOVERY 13WEEKS								
STUDY ID : GT14-00042			UNIT : g			SEX : MALE		
GROUP: (mean±S.E)		Control	Low		Medium	High		
1 Week		323.67 ± 3.16 (5)	323.18 ± 3.51 (5)	311.67 ± 11.01 (5)	314.82 ± 6.99 (5)			
2 Week		328.95 ± 3.38 (5)	331.46 ± 5.35 (5)	321.02 ± 11.61 (5)	324.07 ± 6.72 (5)			
3 Week		335.96 ± 2.40 (5)	339.15 ± 4.90 (5)	330.07 ± 11.36 (5)	331.79 ± 7.05 (5)			
4 Week		342.50 ± 4.50 (5)	346.44 ± 4.84 (5)	334.02 ± 11.60 (5)	337.41 ± 6.79 (5)			
5 Week		349.62 ± 3.71 (5)	353.18 ± 5.08 (5)	341.03 ± 11.93 (5)	343.37 ± 7.28 (5)			
6 Week		354.83 ± 4.40 (5)	355.73 ± 5.03 (5)	346.43 ± 12.30 (5)	350.08 ± 7.21 (5)			
7 Week		358.52 ± 4.12 (5)	361.46 ± 5.31 (5)	351.56 ± 11.69 (5)	354.45 ± 7.31 (5)			
8 Week		360.57 ± 4.40 (5)	362.81 ± 6.53 (5)	358.51 ± 12.43 (5)	361.01 ± 8.41 (5)			
9 Week		364.41 ± 3.15 (5)	371.31 ± 5.30 (5)	362.38 ± 12.14 (5)	361.83 ± 7.84 (5)			
10 Week		370.35 ± 4.14 (5)	373.99 ± 5.60 (5)	365.00 ± 12.31 (5)	365.95 ± 7.00 (5)			
11 Week		372.04 ± 4.82 (5)	378.12 ± 5.33 (5)	369.93 ± 12.43 (5)	368.17 ± 7.56 (5)			
12 Week		377.30 ± 4.56 (5)	379.44 ± 5.22 (5)	372.61 ± 12.12 (5)	371.88 ± 7.56 (5)			
13 Week		378.99 ± 3.81 (5)	382.05 ± 4.91 (5)	367.93 ± 14.03 (5)	372.97 ± 8.16 (5)			
Sacrifice		357.32 ± 3.77 (5)	360.07 ± 5.29 (5)	345.33 ± 13.07 (5)	350.24 ± 7.73 (5)			

() : animal number

Table 7-1. Food consumption in male rats in exposure group

SUMMARY OF FOOD CONSUMPTION EXPOSURE 13WEEKS								
STUDY ID : GT14-00042		UNIT : g			SEX : MALE			
GROUP : (mean±S.E)	Control	Low	Medium	High				
1 Week	16.61 ±0.40 (15)	16.08 ±0.46 (15)	16.51 ±0.34 (15)	17.38 ±0.42 (15)				
2 Week	17.16 ±0.39 (15)	17.24 ±0.43 (15)	17.69 ±0.39 (15)	17.00 ±0.49 (15)				
3 Week	18.26 ±0.37 (15)	17.70 ±0.31 (15)	17.77 ±0.59 (15)	18.30 ±0.43 (15)				
4 Week	17.43 ±0.33 (15)	18.06 ±0.35 (15)	17.73 ±0.36 (15)	17.17 ±0.56 (15)				
5 Week	20.78 ±0.51 (15)	19.90 ±0.60 (15)	20.25 ±0.47 (15)	20.88 ±0.37 (15)				
6 Week	19.36 ±0.32 (15)	20.09 ±0.45 (15)	19.54 ±0.35 (15)	19.61 ±0.47 (15)				
7 Week	17.25 ±0.37 (15)	17.36 ±0.51 (15)	18.43 ±0.36 (15)	18.07 ±0.43 (15)				
8 Week	18.83 ±0.53 (15)	19.05 ±0.40 (15)	17.58 ±0.51 (15)	18.39 ±0.53 (15)				
9 Week	18.48 ±0.40 (15)	18.59 ±0.32 (15)	18.09 ±0.52 (15)	18.23 ±0.47 (15)				
10 Week	19.29 ±0.56 (15)	19.00 ±0.27 (15)	17.60 ±0.63 (15)	18.30 ±0.52 (15)				
11 Week	17.61 ±0.55 (15)	18.79 ±0.41 (15)	18.28 ±0.56 (15)	18.35 ±0.59 (15)				
12 Week	17.91 ±1.10 (15)	19.05 ±0.52 (15)	18.71 ±0.46 (14)	18.46 ±0.44 (15)				
13 Week	18.57 ±0.36 (15)	18.94 ±0.53 (15)	17.90 ±0.63 (14)	17.82 ±0.41 (15)				

() : animal number

Table 7-2. Food consumption in female rats in exposure group

SUMMARY OF FOOD CONSUMPTION EXPOSURE 13WEEKS								
STUDY ID : GT14-00042		UNIT : g			SEX : FEMALE			
GROUP (mean±S.E)	:	Control	Low	Medium	High			
1 Week		12.73 ±0.35 (10)	13.29 ±0.52 (10)	12.84 ±0.48 (10)	13.96 ±0.50 (10)			
2 Week		13.12 ±0.40 (10)	13.11 ±0.61 (10)	12.31 ±0.44 (10)	13.10 ±0.48 (10)			
3 Week		12.61 ±0.38 (10)	12.30 ±0.48 (10)	12.16 ±0.45 (10)	13.06 ±0.33 (10)			
4 Week		11.77 ±0.33 (10)	11.67 ±0.53 (10)	11.50 ±0.42 (10)	11.92 ±0.23 (10)			
5 Week		13.67 ±0.46 (10)	14.32 ±0.69 (10)	16.62 ±0.34 (10)	15.56 ±0.43 (10)			
6 Week		12.65 ±0.44 (10)	13.25 ±0.49 (10)	12.52 ±0.33 (10)	12.00 ±0.34 (10)			
7 Week		12.80 ±0.44 (10)	12.27 ±0.75 (10)	12.16 ±0.74 (10)	13.07 ±0.45 (10)			
8 Week		12.38 ±0.40 (10)	13.13 ±0.64 (10)	12.04 ±0.53 (10)	12.36 ±0.42 (10)			
9 Week		12.26 ±0.38 (10)	11.97 ±0.76 (10)	12.87 ±0.48 (10)	12.95 ±0.40 (10)			
10 Week		12.52 ±0.38 (10)	12.78 ±0.55 (10)	12.38 ±0.36 (10)	12.61 ±0.53 (10)			
11 Week		11.65 ±0.38 (10)	11.87 ±0.40 (10)	12.61 ±0.46 (10)	13.11 ±0.46 (10)			
12 Week		12.91 ±0.50 (10)	12.42 ±0.58 (10)	12.87 ±0.43 (10)	12.54 ±0.57 (10)			
13 Week		11.99 ±0.48 (10)	11.66 ±0.56 (10)	12.80 ±0.50 (10)	12.93 ±0.57 (10)			

() : animal number

Table 7-3. Food consumption in male rats in recovery group

SUMMARY OF FOOD CONSUMPTION RECOVERY 13WEEKS								
STUDY ID : GT14-00042		UNIT : g				SEX : MALE		
GROUP (mean±S.E)	:	Control	Low	Medium	High			
1 Week		22.20 ±0.86 (5)	24.00 ±1.27 (5)	23.60 ±0.81 (5)	22.20 ±1.16 (5)			
2 Week		21.20 ±0.74 (5)	22.40 ±1.12 (5)	21.80 ±1.02 (5)	22.80 ±0.49 (5)			
3 Week		22.60 ±0.68 (5)	21.40 ±0.75 (5)	23.20 ±1.02 (5)	22.20 ±0.74 (5)			
4 Week		23.80 ±0.37 (5)	22.60 ±0.68 (5)	22.60 ±0.93 (5)	20.80 ±1.20 (5)			
5 Week		22.40 ±0.75 (5)	22.80 ±0.86 (5)	24.20 ±1.24 (5)	22.60 ±1.17 (5)			
6 Week		22.60 ±0.60 (5)	22.60 ±0.81 (5)	23.40 ±1.47 (5)	22.20 ±0.80 (5)			
7 Week		22.20 ±0.58 (5)	22.60 ±0.93 (5)	23.00 ±0.89 (5)	22.80 ±0.49 (5)			
8 Week		22.40 ±0.51 (5)	21.80 ±0.97 (5)	22.80 ±1.24 (5)	23.00 ±1.05 (5)			
9 Week		20.80 ±0.37 (5)	21.40 ±0.81 (5)	23.40 ±0.93 (5)	21.40 ±0.60 (5)			
10 Week		23.80 ±0.66 (5)	21.60 ±1.29 (5)	22.40 ±1.03 (5)	21.40 ±1.12 (5)			
11 Week		21.60 ±0.60 (5)	21.40 ±0.81 (5)	24.20 ±1.16 (5)	22.00 ±0.55 (5)			
12 Week		22.40 ±0.68 (5)	21.40 ±0.87 (5)	23.00 ±0.84 (5)	21.00 ±0.84 (5)			
13 Week		21.80 ±0.37 (5)	22.40 ±0.51 (5)	21.60 ±2.99 (5)	22.40 ±1.17 (5)			

() : animal number

Table 8-1. Urinalysis of male rats in exposure group

SUMMARY OF URINALYSIS EXPOSURE 13WEEKS									
STUDY ID : GT14-00042									
Group		Control		Low		Medium		High	
No. of animals examined		5	%	5	%	5	%	5	%
Glucose	negative	4	80	5	100	5	100	5	100
	trace	1	20	0	0	0	0	0	0
Bilirubin	negative	5	100	5	100	5	100	5	100
Ketone ^a	negative	0	0	0	0	1	20	0	0
	trace	0	0	1	20	3	60	5	100
	1+	5	100	4	80	1	20	0	0
Specific Gravity	1.005	0	0	0	0	1	20	0	0
	1.010	0	0	0	0	0	0	1	20
	1.015	0	0	1	20	3	60	3	60
	1.020	0	0	3	60	0	0	1	20
	1.025	1	20	0	0	0	0	0	0
	1.030	4	80	1	20	1	20	0	0
Occult Blood	negative	2	40	4	80	2	40	1	20
	trace	3	60	1	20	3	60	4	80
pH ^b	5.0	1	20	0	0	0	0	0	0
	5.5	3	60	1	20	1	20	0	0
	6.0	1	20	4	80	0	0	0	0
	6.5	0	0	0	0	3	60	1	20
	7.0	0	0	0	0	1	20	3	60
	7.5	0	0	0	0	0	0	1	20
Protein	1+	0	0	1	20	2	40	2	40
	2+	4	80	4	80	3	60	3	60
	3+	1	20	0	0	0	0	0	0
Urobilinogen	0.2 E.U./dl	5	100	5	100	5	100	5	100
Nitrate	negative	3	60	5	100	5	100	5	100
	positive	2	40	0	0	0	0	0	0
Leukocyte	trace	5	100	5	100	5	100	5	100

a : p<0.01, significant male

b : p<0.01, significant male

Table 8-2. Urinalysis of female rats in exposure group

SUMMARY OF URINALYSIS									
EXPOSURE 13WEEKS									
STUDY ID : GT14-00042									
Group		Control	Low		Medium		High		
No. of animals examined		5	%	5	%	5	%	5	%
Glucose	negative	5	100	5	100	5	100	5	100
Bilirubin	negative	5	100	5	100	5	100	5	100
Ketone	negative	5	100	5	100	5	100	5	100
Specific Gravity	1.005	3	60	1	20	2	40	0	0
	1.010	2	40	1	20	1	20	3	60
	1.015	0	0	3	60	1	20	2	40
	1.020	0	0	0	0	1	20	0	0
Occult Blood	negative	5	100	5	100	5	100	5	100
pH	6.0	2	40	0	0	0	0	0	0
	6.5	0	0	1	20	3	60	0	0
	7.0	3	60	3	60	2	40	3	60
	7.5	0	0	1	20	0	0	2	40
Protein	negative	5	100	4	80	4	80	3	60
	trace	0	0	1	20	1	20	1	20
	1+	0	0	0	0	0	0	1	20
Urobilinogen	0.2 E.U./dl	5	100	5	100	5	100	5	100
Nitrate	negative	5	100	5	100	5	100	5	100
Leukocyte	negative	5	100	5	100	5	100	5	100

Table 8-3. Urinalysis of male rats in recovery group

SUMMARY OF URINALYSIS RECOVERY 13WEEKS									
STUDY ID : GT14-00042									
Group		Control		Low		Medium		High	
No. of animals examined		5	%	5	%	5	%	5	%
Glucose	negative	5	100	4	80	5	100	5	100
	trace	0	0	1	20	0	0	0	0
Bilirubin	negative	4	80	5	100	5	100	5	100
	1+	1	20	0	0	0	0	0	0
Ketone	trace	1	20	1	20	2	40	2	40
	1+	4	80	4	80	3	60	3	60
Specific Gravity	1.010	1	20	0	0	3	60	0	0
	1.015	1	20	2	40	1	20	3	60
	1.020	0	0	0	0	1	20	1	20
	1.025	3	60	2	40	0	0	0	0
	1.030	0	0	1	20	0	0	1	20
Occult Blood ^a	negative	0	0	4	80	5	100	0	0
	trace	2	40	1	20	0	0	4	80
	1+	1	20	0	0	0	0	0	0
	2+	1	20	0	0	0	0	1	20
	3+	1	20	0	0	0	0	0	0
pH	6.5	2	40	1	20	1	20	2	40
	7.0	2	40	2	40	1	20	3	60
	7.5	1	20	1	20	2	40	0	0
	8.0	0	0	1	20	1	20	0	0
Protein	1+	0	0	0	0	1	20	0	0
	2+	2	40	4	80	3	60	2	40
	3+	3	60	1	20	1	20	3	60
Urobilinogen	0.2 E.U./dl	5	100	4	80	5	100	5	100
	1.0 E.U./dl	0	0	1	20	0	0	0	0
Nitrate	negative	5	100	5	100	5	100	5	100
Leukocyte	trace	0	0	1	20	1	20	0	0
	1+	2	40	0	0	3	60	0	0
	2+	1	20	0	0	0	0	0	0
	3+	2	40	4	80	1	20	5	100

a : p<0.05, significant male

Table 9-1. Ophthalmoscopical examination of male rats in exposure group

SUMMARY OF OPHTHALMOSCOPIC ANALYSIS						
STUDY ID : GT14-00042				SEX: MALE		
GROUP				Control		High
Number of animals				10	%	10
Eye	right	Nomal	10	100	10	100
	left	Nomal	10	100	10	100

Table 9-2. Ophthalmoscopical examination of female rats in exposure group

SUMMARY OF OPHTHALMOSCOPIC ANALYSIS						
STUDY ID : GT14-00042				SEX: FEMALE		
GROUP				Control		High
Number of animals				10	%	10
Eye	right	Nomal	10	100	10	100
	left	Nomal	10	100	10	100

Table 9-3. Ophthalmoscopical examination of male rats in recovery group

SUMMARY OF OPHTHALMOSCOPIC ANALYSIS						
RECOVERY 13WEEKS						
STUDY ID : GT14-00042				SEX: MALE		
GROUP				Control		High
Number of animals				5	%	5
Eye	right	Nomal	5	100	5	100
	left	Nomal	5	100	5	100

Table 10-1. Gross findings of male rats in exposure group

SUMMARY OF GROSS FINDINGS EXPOSURE 13WEEKS					
STUDY ID : GT14-00042		SEX : MALE			
ORGAN	OBSERVATION	GROUP			
		Control	Low	Medium	
TESTIS (LEFT)	Normal	10/10	10/10	9/10	10/10
TESTIS (RIGHT)	Normal	10/10	10/10	9/10	10/10
KIDNEY (LEFT)	Normal	10/10	10/10	9/10	10/10
KIDNEY (RIGHT)	Normal	10/10	10/10	9/10	10/10
SPLEEN	Normal	10/10	10/10	9/10	10/10
LIVER	Normal	10/10	10/10	9/10	10/10
ADRENAL GLAND (LEFT)	Normal	10/10	10/10	9/10	10/10
ADRENAL GLAND (RIGHT)	Normal	10/10	10/10	9/10	10/10
HEART	Normal	10/10	10/10	9/10	10/10
THYMUS	Normal	10/10	10/10	9/10	10/10
LUNG (LEFT)	Normal	10/10	10/10	9/10	10/10
LUNG (RIGHT)	Normal	10/10	10/10	9/10	10/10
BRAIN	Normal	10/10	10/10	9/10	10/10
PITUITARY GLAND	Normal	10/10	10/10	9/10	10/10
OLFACTORY BULB	Normal	10/10	10/10	9/10	10/10
EYE (LEFT)	Normal	10/10	10/10	9/10	10/10
EYE (RIGHT)	Normal	10/10	10/10	9/10	10/10
Abdominal cavity [*]	Normal	10/10	10/10	9/10	10/10
	Abnormal ^a	0/10	0/10	1/10	0/10
Urinary bladder [*]	Normal	10/10	10/10	9/10	10/10
	Abnormal ^b	0/10	0/10	1/10	0/10

^{*} : The abnormal sign in dead animal

a : exudate, red , b : dilatation, red urine in lumen

Table 10-2. Gross findings of female rats in exposure group

SUMMARY OF GROSS FINDINGS EXPOSURE 13WEEKS					
STUDY ID : GT14-00042		SEX : FEMALE			
ORGAN	OBSERVATION	Control	GROUP Low	Medium	High
OVARIUM (LEFT)	Normal	10/10	10/10	10/10	10/10
OVARIUM (RIGHT)	Normal	10/10	10/10	10/10	10/10
KIDNEY (LEFT)	Normal	10/10	10/10	10/10	10/10
KIDNEY (RIGHT)	Normal	10/10	10/10	10/10	10/10
SPLEEN	Normal	10/10	10/10	10/10	10/10
LIVER	Normal	10/10	10/10	10/10	10/10
ADRENAL GLAND (LEFT)	Normal	10/10	10/10	10/10	10/10
ADRENAL GLAND (RIGHT)	Normal	10/10	10/10	10/10	10/10
HEART	Normal	10/10	10/10	10/10	10/10
THYMUS	Normal	10/10	10/10	10/10	10/10
LUNG (LEFT)	Normal	10/10	10/10	10/10	10/10
LUNG (RIGHT)	Normal	10/10	10/10	10/10	10/10
BRAIN	Normal	10/10	10/10	10/10	10/10
PITUITARY GLAND	Normal	10/10	10/10	10/10	10/10
OLFACCTORY BULB	Normal	10/10	10/10	10/10	10/10
EYE (LEFT)	Normal	10/10	10/10	10/10	10/10
EYE (RIGHT)	Normal	10/10	10/10	10/10	10/10

Table 10-3. Gross findings of male rats in recovery group

SUMMARY OF GROSS FINDINGS RECOVERY 13WEEKS					
STUDY ID : GT14-00042		SEX : MALE			
ORGAN	OBSERVATION	GROUP			
		Control	Low	Medium	
TESTIS (LEFT)	Normal	5/5	5/5	5/5	5/5
TESTIS (RIGHT)	Normal	5/5	4/5	5/5	5/5
	Abnormal ^a	0/5	1/5	0/5	0/5
KIDNEY (LEFT)	Normal	5/5	5/5	5/5	5/5
KIDNEY (RIGHT)	Normal	5/5	5/5	5/5	5/5
SPLEEN	Normal	5/5	5/5	5/5	5/5
LIVER	Normal	5/5	5/5	5/5	5/5
ADRENAL GLAND (LEFT)	Normal	5/5	5/5	5/5	5/5
ADRENAL GLAND (RIGHT)	Normal	5/5	5/5	5/5	5/5
HEART	Normal	5/5	5/5	5/5	5/5
THYMUS	Normal	5/5	5/5	5/5	5/5
LUNG (LEFT)	Normal	5/5	5/5	5/5	5/5
LUNG (RIGHT)	Normal	5/5	5/5	5/5	5/5
BRAIN	Normal	5/5	5/5	5/5	5/5
PITUITARY GLAND	Normal	5/5	5/5	5/5	5/5
OLFACTORY BULB	Normal	5/5	5/5	5/5	5/5
EYE (LEFT)	Normal	5/5	5/5	5/5	5/5
EYE (RIGHT)	Normal	5/5	5/5	5/5	5/5
EPIDIDYMIS (RIGHT)	Normal	5/5	4/5	5/5	5/5
	Abnormal ^a	0/5	1/5	0/5	0/5

a : small

Table 11-1. Absolute organ weights of male rats in exposure group

SUMMARY OF ABSOLUTE ORGAN WEIGHTS EXPOSURE 13WEEKS								
STUDY ID : GT14-00042		UNIT : g				SEX : MALE		
ORGAN	Control	Low		Medium		High		
BODY WEIGHT	276.88 ±4.28 (10)	281.73 ±5.24 (10)	272.28 ±4.83 (9)	279.10 ±6.10 (10)				
TESTIS (LEFT)	1.40 ±0.02 (10)	1.42 ±0.01 (10)	1.40 ±0.02 (9)	1.42 ±0.02 (10)				
TESTIS (RIGHT)	1.36 ±0.01 (10)	1.40 ±0.02 (10)	1.36 ±0.03 (9)	1.38 ±0.02 (10)				
SPLEEN	0.59 ±0.01 (10)	0.59 ±0.01 (10)	0.59 ±0.02 (9)	0.58 ±0.02 (10)				
LIVER	7.62 ±0.16 (10)	7.59 ±0.18 (10)	7.53 ±0.20 (9)	7.54 ±0.16 (10)				
THYMUS	0.15 ±0.01 (10)	0.15 ±0.01 (10)	0.14 ±0.01 (9)	0.15 ±0.01 (10)				
ADRENAL GLAND (LEFT)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (9)	0.03 ±0.00 (10)				
ADRENAL GLAND (RIGHT)	0.03 ±0.00 (10)	0.02 ±0.00 (10)	0.03 ±0.00 (9)	0.02 ±0.00 (10)				
KIDNEY (LEFT)	0.86 ±0.02 (10)	0.87 ±0.02 (10)	0.86 ±0.01 (9)	0.85 ±0.02 (10)				
KIDNEY (RIGHT)	0.86 ±0.01 (10)	0.88 ±0.02 (10)	0.87 ±0.02 (9)	0.87 ±0.02 (10)				
HEART	0.85 ±0.02 (10)	0.87 ±0.02 (10)	0.84 ±0.01 (9)	0.82 ±0.01 (10)				
LUNG (LEFT)	0.33 ±0.00 (5)	0.37 ±0.02 (5)	0.35 ±0.01 (4)	0.39 ±0.01 ^a (5)				
LUNG (RIGHT)	0.63 ±0.02 (5)	0.68 ±0.04 (5)	0.65 ±0.02 (4)	0.70 ±0.01 (5)				
BRAIN	1.70 ±0.14 (10)	1.70 ±0.13 (10)	1.90 ±0.01 (9)	1.91 ±0.01 (10)				
PITUITARY GLAND	0.01 ±0.00 (10)	0.01 ±0.00 (10)	0.01 ±0.00 (9)	0.01 ±0.00 (10)				
OLFACCTORY	0.09 ±0.00 (10)	0.09 ±0.00 (10)	0.09 ±0.00 (9)	0.09 ±0.00 (10)				

() : number

a : p<0.05, control vs. high group (↑)

Table 11-2. Absolute organ weights of female rats in exposure group

SUMMARY OF ABSOLUTE ORGAN WEIGHTS EXPOSURE 13WEEKS								
STUDY ID : GT14-00042		UNIT : g				SEX : FEMALE		
ORGAN	Control	Low		Medium		High		
BODY WEIGHT	156.27 ±2.93 (10)	161.12 ±4.84 (10)	160.63 ±3.51 (10)	160.21 ±3.04 (10)				
OVARIUM (LEFT)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)		
OVARIUM (RIGHT)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)		
SPLEEN	0.38 ±0.01 (10)	0.40 ±0.01 (10)	0.39 ±0.01 (10)	0.39 ±0.01 (10)	0.39 ±0.01 (10)	0.39 ±0.01 (10)		
LIVER	4.30 ±0.09 (10)	4.24 ±0.16 (10)	4.27 ±0.15 (10)	4.27 ±0.09 (10)	4.27 ±0.09 (10)	4.27 ±0.09 (10)		
THYMUS	0.14 ±0.01 (10)	0.14 ±0.01 (10)	0.14 ±0.01 (10)	0.14 ±0.01 (10)	0.14 ±0.01 (10)	0.14 ±0.01 (10)		
ADRENAL GLAND (LEFT)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)		
ADRENAL GLAND (RIGHT)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)	0.03 ±0.00 (10)		
KIDNEY (LEFT)	0.57 ±0.01 (10)	0.58 ±0.02 (10)	0.57 ±0.01 (10)	0.56 ±0.01 (10)	0.56 ±0.01 (10)	0.56 ±0.01 (10)		
KIDNEY (RIGHT)	0.57 ±0.01 (10)	0.57 ±0.01 (10)	0.57 ±0.01 (10)	0.56 ±0.01 (10)	0.56 ±0.01 (10)	0.56 ±0.01 (10)		
HEART	0.58 ±0.02 (10)	0.56 ±0.02 (10)	0.58 ±0.02 (10)	0.56 ±0.01 (10)	0.56 ±0.01 (10)	0.56 ±0.01 (10)		
LUNG (LEFT)	0.27 ±0.01 (5)	0.28 ±0.00 (5)	0.27 ±0.01 (5)	0.27 ±0.01 (5)	0.27 ±0.01 (5)	0.27 ±0.01 (5)		
LUNG (RIGHT)	0.50 ±0.01 (5)	0.51 ±0.01 (5)	0.50 ±0.01 (5)	0.51 ±0.02 (5)	0.51 ±0.02 (5)	0.51 ±0.02 (5)		
BRAIN	1.78 ±0.01 (10)	1.68 ±0.10 (10)	1.78 ±0.01 (10)	1.78 ±0.01 (10)	1.78 ±0.01 (10)	1.78 ±0.01 (10)		
PITUITARY GLAND	0.01 ±0.00 (10)	0.01 ±0.00 (10)	0.01 ±0.00 (10)	0.01 ±0.00 (10)	0.01 ±0.00 (10)	0.01 ±0.00 (10)		
OLFACTORY	0.08 ±0.00 (10)	0.08 ±0.00 (10)	0.08 ±0.00 (10)	0.08 ±0.00 (10)	0.08 ±0.00 (10)	0.08 ±0.00 (10)		

() : number

Table 11-3. Absolute organ weights of male rats in recovery group

SUMMARY OF ABSOLUTE ORGAN WEIGHTS								
RECOVERY 13WEEKS								
STUDY ID : GT14-00042		UNIT : g				SEX : MALE		
GROUP : (mean±S.E)								
ORGAN	Control	Low		Medium		High		
BODY WEIGHT	357.32 ± 3.77 (5)	360.07 ± 5.29 (5)	345.33 ± 13.07 (5)	350.24 ± 7.73 (5)				
TESTIS (LEFT)	1.51 ± 0.02 (5)	1.56 ± 0.02 (5)	1.49 ± 0.02 (5)	1.53 ± 0.01 (5)				
TESTIS (RIGHT)	1.51 ± 0.03 (5)	1.40 ± 0.09 (5)	1.49 ± 0.02 (5)	1.47 ± 0.03 (5)				
SPLEEN	0.73 ± 0.02 (5)	0.77 ± 0.02 (5)	0.72 ± 0.04 (5)	0.73 ± 0.03 (5)				
LIVER	10.18 ± 0.08 (5)	10.28 ± 0.20 (5)	9.60 ± 0.46 (5)	10.36 ± 0.21 (5)				
THYMUS	0.12 ± 0.01 (5)	0.12 ± 0.00 (5)	0.11 ± 0.01 (5)	0.12 ± 0.01 (5)				
ADRENAL GLAND (LEFT)	0.03 ± 0.00 (5)	0.03 ± 0.00 (5)	0.03 ± 0.00 (5)	0.03 ± 0.00 (5)				
ADRENAL GLAND (RIGHT)	0.02 ± 0.00 (5)	0.02 ± 0.00 (5)	0.03 ± 0.00 (5)	0.02 ± 0.00 (5)				
KIDNEY (LEFT)	1.05 ± 0.01 (5)	1.07 ± 0.03 (5)	1.03 ± 0.02 (5)	1.06 ± 0.03 (5)				
KIDNEY (RIGHT)	1.05 ± 0.02 (5)	1.07 ± 0.03 (5)	1.06 ± 0.03 (5)	1.05 ± 0.02 (5)				
HEART	1.03 ± 0.03 (5)	1.00 ± 0.03 (5)	1.01 ± 0.04 (5)	0.98 ± 0.03 (5)				
LUNG (LEFT)	0.41 ± 0.01 (5)	0.42 ± 0.01 (5)	0.44 ± 0.02 (5)	0.40 ± 0.01 (5)				
BRAIN	2.00 ± 0.02 (5)	1.98 ± 0.02 (5)	2.00 ± 0.02 (5)	1.96 ± 0.01 (5)				
PITUITARY GLAND	0.01 ± 0.00 (5)	0.01 ± 0.00 (5)	0.01 ± 0.00 (5)	0.01 ± 0.00 (5)				
OLFACCTORY	0.09 ± 0.01 (5)	0.09 ± 0.01 (5)	0.09 ± 0.01 (5)	0.08 ± 0.01 (5)				

() : animal number

Table 12-1. Relative organ weights of male rats in exposure group

SUMMARY OF RELATIVE ORGAN WEIGHTS EXPOSURE 13WEEKS								
STUDY ID : GT14-00042		UNIT : % BODY WEIGHTS				SEX : MALE		
ORGAN	Control	Low		Medium		High		
BODY WEIGHT	276.88 ± 4.28 (10)	281.73 ± 5.24 (10)	272.28 ± 4.83 (9)	279.10 ± 6.10 (10)				
TESTIS (LEFT)	0.51 ± 0.00 (10)	0.50 ± 0.01 (10)	0.51 ± 0.01 (9)	0.51 ± 0.01 (10)				
TESTIS (RIGHT)	0.49 ± 0.01 (10)	0.50 ± 0.01 (10)	0.50 ± 0.01 (9)	0.50 ± 0.01 (10)				
SPLEEN	0.21 ± 0.00 (10)	0.21 ± 0.00 (10)	0.22 ± 0.01 (9)	0.21 ± 0.00 (10)				
LIVER	2.75 ± 0.04 (10)	2.69 ± 0.04 (10)	2.76 ± 0.03 (9)	2.70 ± 0.02 (10)				
THYMUS	0.06 ± 0.00 (10)	0.05 ± 0.00 (10)	0.05 ± 0.00 (9)	0.05 ± 0.00 (10)				
ADRENAL GLAND (LEFT)	0.01 ± 0.00 (10)	0.01 ± 0.00 (10)	0.01 ± 0.00 (9)	0.01 ± 0.00 (10)				
ADRENAL GLAND (RIGHT)	0.01 ± 0.00 (10)	0.01 ± 0.00 (10)	0.01 ± 0.00 (9)	0.01 ± 0.00 (10)				
KIDNEY (LEFT)	0.31 ± 0.00 (10)	0.31 ± 0.00 (10)	0.32 ± 0.00 (9)	0.31 ± 0.00 (10)				
KIDNEY (RIGHT)	0.31 ± 0.00 (10)	0.31 ± 0.00 (10)	0.32 ± 0.00 (9)	0.31 ± 0.01 (10)				
HEART	0.31 ± 0.00 (10)	0.31 ± 0.01 (10)	0.31 ± 0.00 (9)	0.30 ± 0.01 (10)				
LUNG (LEFT)	0.12 ± 0.00 (5)	0.13 ± 0.01 (5)	0.12 ± 0.00 (4)	0.13 ± 0.00 (5)				
LUNG (RIGHT)	0.23 ± 0.01 (5)	0.24 ± 0.01 (5)	0.23 ± 0.01 (4)	0.24 ± 0.01 (5)				
BRAIN	0.61 ± 0.05 (10)	0.60 ± 0.05 (10)	0.70 ± 0.01 (9)	0.69 ± 0.02 (10)				
PITUITARY GLAND	0.00 ± 0.00 (10)	0.00 ± 0.00 (10)	0.00 ± 0.00 (9)	0.00 ± 0.00 (10)				
OLFACCTORY	0.03 ± 0.00 (10)	0.03 ± 0.00 (10)	0.03 ± 0.00 (9)	0.03 ± 0.00 (10)				

() : number

Table 12-2. Relative organ weights of female rats in exposure group

SUMMARY OF RELATIVE ORGAN WEIGHTS EXPOSURE 13WEEKS							
STUDY ID : GT14-00042		UNIT : % BODY WEIGHTS			SEX : FEMALE		
ORGAN	Control	Low	Medium	High			
BODY WEIGHT	156.27 ± 2.93 (10)	161.12 ± 4.84 (10)	160.63 ± 3.51 (10)	160.21 ± 30.4 (10)			
OVARIUM (LEFT)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)			
OVARIUM (RIGHT)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)			
SPLEEN	0.24 ± 0.00 (10)	0.25 ± 0.01 (10)	0.24 ± 0.01 (10)	0.24 ± 0.01 (10)			
LIVER	2.75 ± 0.05 (10)	2.63 ± 0.05 (10)	2.65 ± 0.06 (10)	2.66 ± 0.02 (10)			
THYMUS	0.09 ± 0.00 (10)	0.09 ± 0.00 (10)	0.09 ± 0.00 (10)	0.09 ± 0.00 (10)			
ADRENAL GLAND (LEFT)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)			
ADRENAL GLAND (RIGHT)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)			
KIDNEY (LEFT)	0.36 ± 0.01 (10)	0.36 ± 0.00 (10)	0.35 ± 0.01 (10)	0.35 ± 0.01 (10)			
KIDNEY (RIGHT)	0.36 ± 0.01 (10)	0.35 ± 0.00 (10)	0.36 ± 0.00 (10)	0.35 ± 0.01 (10)			
HEART	0.37 ± 0.01 (10)	0.35 ± 0.01 (10)	0.36 ± 0.01 (10)	0.35 ± 0.01 (10)			
LUNG (LEFT)	0.18 ± 0.01 (5)	0.17 ± 0.00 (5)	0.16 ± 0.01 (5)	0.17 ± 0.00 (5)			
LUNG (RIGHT)	0.32 ± 0.01 (5)	0.30 ± 0.01 ^a (5)	0.30 ± 0.01 (5)	0.31 ± 0.00 (5)			
BRAIN	1.14 ± 0.02 (10)	1.05 ± 0.07 (10)	1.11 ± 0.02 (10)	1.11 ± 0.02 (10)			
PITUITARY GLAND	0.01 ± 0.00 (10)	0.01 ± 0.00 (10)	0.01 ± 0.00 (10)	0.01 ± 0.00 (10)			
OLFACCTORY	0.05 ± 0.00 (10)	0.05 ± 0.00 (10)	0.05 ± 0.00 (10)	0.05 ± 0.00 (10)			

() : number

a : p<0.05 , control vs. low group (↓)

Table 12-3. Relative organ weights of male rats in recovery group

SUMMARY OF RELATIVE ORGAN WEIGHTS RECOVERY 13WEEKS								
STUDY ID : GT14-00042		UNIT : % BODY WEIGHTS				SEX : MALE		
ORGAN	Control	Low		Medium		High		
BODY WEIGHT	357.32 ±3.77 (5)	360.07 ±5.29 (5)	345.33 ±13.07 (5)	350.24 ±7.73 (5)				
TESTIS (LEFT)	0.42 ±0.01 (5)	0.43 ±0.00 (5)	0.43 ±0.02 (5)	0.44 ±0.01 (5)				
TESTIS (RIGHT)	0.42 ±0.01 (5)	0.39 ±0.03 (5)	0.43 ±0.01 (5)	0.42 ±0.01 (5)				
SPLEEN	0.21 ±0.01 (5)	0.21 ±0.00 (5)	0.21 ±0.01 (5)	0.21 ±0.01 (5)				
LIVER	2.85 ±0.02 (5)	2.86 ±0.03 (5)	2.78 ±0.04 ^a (5)	2.96 ±0.04 (5)				
THYMUS	0.03 ±0.00 (5)	0.03 ±0.00 (5)	0.03 ±0.00 (5)	0.03 ±0.00 (5)				
ADRENAL GLAND (LEFT)	0.01 ±0.00 (5)	0.01 ±0.00 (5)	0.01 ±0.00 (5)	0.01 ±0.00 (5)				
ADRENAL GLAND (RIGHT)	0.01 ±0.00 (5)	0.01 ±0.00 (5)	0.01 ±0.00 (5)	0.01 ±0.00 (5)				
KIDNEY (LEFT)	0.29 ±0.00 (5)	0.30 ±0.00 (5)	0.30 ±0.00 (5)	0.30 ±0.00 (5)				
KIDNEY (RIGHT)	0.30 ±0.01 (5)	0.30 ±0.00 (5)	0.31 ±0.01 (5)	0.30 ±0.00 (5)				
HEART	0.29 ±0.01 (5)	0.28 ±0.00 (5)	0.29 ±0.00 (5)	0.28 ±0.01 (5)				
LUNG (LEFT)	0.11 ±0.00 (5)	0.12 ±0.00 (5)	0.13 ±0.00 (5)	0.11 ±0.00 (5)				
BRAIN	0.56 ±0.01 (5)	0.55 ±0.00 (5)	0.58 ±0.02 (5)	0.56 ±0.01 (5)				
PITUITARY GLAND	0.00 ±0.00 (5)	0.00 ±0.00 (5)	0.00 ±0.00 (5)	0.00 ±0.00 (5)				
OLFACTORY	0.03 ±0.00 (5)	0.02 ±0.00 (5)	0.03 ±0.00 (5)	0.02 ±0.00 (5)				

() : animal number

a : p<0.05 , high vs. medium group (↓)

Table 13-1. Serum biochemical values of male rats in exposure group

SUMMARY OF SERUM BIOCHEMICAL VALUES TESTS EXPOSURE 13WEEKS								
STUDY ID : GT14-00042 GROUP : (mean±S.E)					SEX : MALE			
	Control	Low	Medium	High				
ALB ¹ (g/dL)	2.84 ± 0.04 (10)	2.79 ± 0.02 (10)	2.82 ± 0.02 (9)	2.81 ± 0.02 (10)				
ALP ² (IU/L)	380.40 ± 20.69 (10)	402.50 ± 18.53 (10)	380.11 ± 14.56 (9)	396.80 ± 11.51 (10)				
CA ³ (mg/dL)	9.23 ± 0.30 (10)	9.69 ± 0.12 (10)	9.69 ± 0.11 (9)	9.67 ± 0.09 (10)				
CHO ⁴ (mg/dL)	79.50 ± 2.06 (10)	74.30 ± 2.56 (10)	74.56 ± 3.39 (9)	77.10 ± 2.42 (10)				
CRE ⁵ (mg/dL)	0.54 ± 0.03 (10)	0.58 ± 0.03 (10)	0.57 ± 0.03 (9)	0.57 ± 0.02 (10)				
GGT ⁶ (IU/L)	0.50 ± 0.17 (10)	0.40 ± 0.16 (10)	0.56 ± 0.18 (9)	0.50 ± 0.17 (10)				
GLU ⁷ (mg/dL)	177.60 ± 3.34 (10)	174.30 ± 5.70 (10)	178.00 ± 3.17 (9)	171.40 ± 3.33 (10)				
AST ⁸ (mg/dL)	124.80 ± 4.83 (10)	123.50 ± 5.36 (10)	125.78 ± 6.57 (9)	142.50 ± 4.94 (10)				
ALT ⁹ (IU/L)	60.30 ± 2.53 (10)	60.90 ± 2.14 (10)	60.44 ± 2.96 (9)	68.50 ± 4.45 (10)				
IP ¹⁰ (mg/dL)	5.81 ± 0.18 (10)	6.43 ± 0.27 (10)	5.90 ± 0.34 (9)	5.77 ± 0.12 (10)				
LDH ¹¹ (IU/L)	755.10 ± 77.21 (10)	837.10 ± 86.32 (10)	763.89 ± 114.18 (9)	976.20 ± 123.23 (10)				
MG ¹² (mg/dL)	2.07 ± 0.03 (10)	2.15 ± 0.05 (10)	2.08 ± 0.04 (9)	2.13 ± 0.03 (10)				
TP ¹³ (g/dL)	6.42 ± 0.07 (10)	6.34 ± 0.05 (10)	6.41 ± 0.07 (9)	6.39 ± 0.06 (10)				
UA ¹⁴ (mg/dL)	0.96 ± 0.08 (10)	1.11 ± 0.05 (10)	0.97 ± 0.05 (9)	1.13 ± 0.07 (10)				
BUN ¹⁵ (mg/dL)	22.73 ± 0.78 (10)	24.24 ± 0.96 (10)	21.92 ± 1.38 (9)	21.29 ± 0.95 (10)				
TBIL ¹⁶ (mg/dL)	0.02 ± 0.01 (10)	0.01 ± 0.00 (10)	0.02 ± 0.00 (9)	0.03 ± 0.01 (10)				
TG ¹⁷ (mg/dL)	82.20 ± 13.27 (10)	81.70 ± 15.30 (10)	91.11 ± 16.36 (9)	64.50 ± 10.37 (10)				
CK ¹⁸ (IU/L)	738.00 ± 83.30 (10)	910.50 ± 90.12 (10)	736.44 ± 95.10 (9)	1116.50 ± 160.89 (10)				
Na ¹⁹ (mmol/L)	141.60 ± 1.10 (10)	143.40 ± 0.64 (10)	142.89 ± 0.42 (9)	143.20 ± 0.25 (10)				
K ²⁰ (mmol/L)	3.94 ± 0.05 (10)	4.03 ± 0.04 (10)	3.99 ± 0.06 (9)	4.08 ± 0.04 (10)				
Cl ²¹ (mmol/L)	105.60 ± 0.86 (10)	102.80 ± 0.44 (10)	103.11 ± 0.39 (9)	103.00 ± 0.30 (10)				
A/G ²²	0.79 ± 0.01 (10)	0.79 ± 0.00 (10)	0.79 ± 0.01 (9)	0.79 ± 0.01 (10)				

() : number

1. Albumin; 2. alkaline phosphatase; 3. Calcium; 4. Total cholesterol; 5. Creatinine; 6. Gamma(y)-glutamyl transferase; 7. Glucose; 8. Aspartate aminotransferase; 9. Alanine aminotransferase; 10. Inorganic phosphorus; 11. Lactate dehydrogenase; 12. Albumin; 13. Total protein; 14. Uric acid; 15. Blood urea nitrogen; 16. Total bilirubin; 17. Triglyceride; 18. Creatine phosphokinase; 19. Sodium; 20. Potassium; 21. Chloride; 22. Albumin/Globulin ratio;

Table 13-2. Serum biochemical values of female rats in exposure group

SUMMARY OF SERUM BIOCHEMICAL VALUES TESTS EXPOSURE 13WEEKS							
STUDY ID : GT14-00042 GROUP : (mean±S.E)					SEX : FEMALE		
	Control	Low	Medium	High			
ALB ¹ (g/dL)	2.85 ± 0.04 (10)	2.83 ± 0.04 (10)	2.90 ± 0.05 (10)	2.83 ± 0.04 (10)			
ALP ² (IU/L)	335.80 ± 15.81 (10)	319.70 ± 20.93 (10)	347.30 ± 21.79 (10)	328.80 ± 15.59 (10)			
CA ³ (mg/dL)	9.20 ± 0.12 (10)	9.34 ± 0.15 (10)	9.35 ± 0.17 (10)	9.38 ± 0.11 (10)			
CHO ⁴ (mg/dL)	87.50 ± 2.20 (10)	86.40 ± 3.87 (10)	88.60 ± 4.97 (10)	88.50 ± 2.81 (10)			
CRE ⁵ (mg/dL)	0.57 ± 0.03 (10)	0.57 ± 0.02 (10)	0.59 ± 0.02 (10)	0.55 ± 0.02 (10)			
GGT ⁶ (IU/L)	0.80 ± 0.13 (10)	1.10 ± 0.18 (10)	1.00 ± 0.15 (10)	1.20 ± 0.25 (10)			
GLU ⁷ (mg/dL)	140.20 ± 4.58 (10)	138.00 ± 8.70 (10)	136.90 ± 6.06 (10)	141.00 ± 5.83 (10)			
AST ⁸ (mg/dL)	145.90 ± 11.71 (10)	159.10 ± 17.51 (10)	158.80 ± 14.38 (10)	157.50 ± 12.76 (10)			
ALT ⁹ (IU/L)	57.90 ± 4.43 (10)	63.00 ± 4.39 (10)	56.60 ± 4.92 (10)	64.10 ± 6.11 (10)			
IP ¹⁰ (mg/dL)	5.65 ± 0.26 (10)	5.77 ± 0.18 (10)	5.71 ± 0.28 (10)	5.01 ± 0.20 (10)			
LDH ¹¹ (IU/L)	1201.50 ± 200.41 (10)	1240.70 ± 237.12 (10)	1340.50 ± 226.20 (10)	1171.90 ± 206.08 (10)			
MG ¹² (mg/dL)	2.22 ± 0.05 (10)	2.17 ± 0.05 (10)	2.20 ± 0.05 (10)	2.11 ± 0.03 (10)			
TP ¹³ (g/dL)	6.19 ± 0.06 (10)	6.16 ± 0.08 (10)	6.27 ± 0.10 (10)	6.29 ± 0.05 (10)			
UA ¹⁴ (mg/dL)	1.18 ± 0.10 (10)	1.21 ± 0.07 (10)	1.30 ± 0.10 (10)	1.23 ± 0.09 (10)			
BUN ¹⁵ (mg/dL)	24.26 ± 0.99 (10)	25.10 ± 0.56 (10)	23.94 ± 0.68 (10)	22.53 ± 0.78 (10)			
TBIL ¹⁶ (mg/dL)	0.01 ± 0.01 (10)	0.01 ± 0.00 (10)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)			
TG ¹⁷ (mg/dL)	16.90 ± 3.14 (10)	18.70 ± 2.76 (10)	17.80 ± 2.01 (10)	17.60 ± 1.30 (10)			
CK ¹⁸ (IU/L)	1027.30 ± 173.12 (10)	1018.60 ± 170.04 (10)	1186.80 ± 199.19 (10)	970.90 ± 160.03 (10)			
Na ¹⁹ (mmol/L)	141.10 ± 0.99 (10)	143.60 ± 0.56 ^a (10)	143.90 ± 0.38 ^a (10)	144.30 ± 0.56 ^a (10)			
K ²⁰ (mmol/L)	3.68 ± 0.06 (10)	3.78 ± 0.07 (10)	3.91 ± 0.07 ^b (10)	3.91 ± 0.05 ^b (10)			
Cl ²¹ (mmol/L)	106.40 ± 0.81 (10)	104.90 ± 0.46 (10)	104.90 ± 0.43 (10)	105.20 ± 0.53 (10)			
A/G ²²	0.85 ± 0.01 (10)	0.85 ± 0.01 (10)	0.86 ± 0.01 (10)	0.82 ± 0.02 (10)			

() : number

a : p<0.01 , control vs. low, medium and high dose group (↑)

b : p<0.05 , control vs. medium and high dose group (↑)

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Table 13-3. Serum biochemical values of male rats in recovery group

SUMMARY OF SERUM BIOCHEMICAL VALUES TESTS RECOVERY 13WEEKS								
STUDY ID : GT14-00042							SEX : MALE	
GROUP (mean±S.E)	Control	Low		Medium		High		
ALB ¹ (g/dL)	2.64 ± 0.04 (5)	2.58 ± 0.04 (5)		2.62 ± 0.04 (5)		2.70 ± 0.08 (5)		
ALP ² (IU/L)	373.00 ± 14.78 (5)	338.80 ± 25.34 (5)		361.80 ± 26.08 (5)		375.60 ± 22.11 (5)		
CA ³ (mg/dL)	9.32 ± 0.10 (5)	9.40 ± 0.14 (5)		9.40 ± 0.16 (5)		9.08 ± 0.31 (5)		
CHO ⁴ (mg/dL)	101.40 ± 1.50 (5)	110.80 ± 4.28 ^a (5)		94.20 ± 2.44 (5)		108.60 ± 4.99 ^a (5)		
CRE ⁵ (mg/dL)	0.63 ± 0.03 (5)	0.68 ± 0.01 (5)		0.78 ± 0.03 ^b (5)		0.70 ± 0.02 (5)		
GGT ⁶ (IU/L)	0.20 ± 0.20 (5)	0.00 ± 0.00 (5)		0.00 ± 0.00 (5)		0.00 ± 0.00 (5)		
GLU ⁷ (mg/dL)	171.00 ± 15.70 (5)	173.60 ± 15.09 (5)		166.20 ± 8.46 (5)		169.40 ± 12.24 (5)		
AST ⁸ (mg/dL)	149.40 ± 22.32 (5)	172.20 ± 36.76 (5)		193.60 ± 20.72 (5)		179.40 ± 5.74 (5)		
ALT ⁹ (IU/L)	81.00 ± 8.08 (5)	95.00 ± 26.39 (5)		104.00 ± 25.27 (5)		87.60 ± 1.97 (5)		
IP ¹⁰ (mg/dL)	5.42 ± 0.11 (5)	5.48 ± 0.17 (5)		6.56 ± 0.35 (5)		5.92 ± 0.24 (5)		
LDH ¹¹ (IU/L)	892.80 ± 282.97 (5)	985.00 ± 357.40 (5)		1459.60 ± 315.24 (5)		1540.20 ± 274.63 (5)		
MG ¹² (mg/dL)	3.12 ± 0.12 (5)	2.62 ± 0.06 ^c (5)		2.84 ± 0.11 (5)		2.72 ± 0.09 ^c (5)		
TP ¹³ (g/dL)	6.78 ± 0.04 (5)	6.72 ± 0.09 (5)		6.92 ± 0.06 (5)		6.76 ± 0.19 (5)		
UA ¹⁴ (mg/dL)	1.08 ± 0.19 (5)	1.02 ± 0.07 (5)		1.20 ± 0.09 (5)		1.00 ± 0.06 (5)		
BUN ¹⁵ (mg/dL)	19.72 ± 0.73 (5)	21.08 ± 0.50 (5)		21.98 ± 0.69 (5)		21.02 ± 0.62 (5)		
TBIL ¹⁶ (mg/dL)	0.02 ± 0.01 (5)	0.01 ± 0.00 (5)		0.01 ± 0.01 (5)		0.01 ± 0.00 (5)		
TG ¹⁷ (mg/dL)	159.40 ± 20.25 (5)	111.60 ± 18.47 (5)		88.00 ± 22.45 (5)		168.20 ± 30.29 (5)		
CK ¹⁸ (IU/L)	408.60 ± 102.32 (5)	446.60 ± 139.03 (5)		844.00 ± 171.41 (5)		631.80 ± 108.14 (5)		
Na ¹⁹ (mmol/L)	144.20 ± 0.20 (5)	144.20 ± 0.86 (5)		146.00 ± 0.84 (5)		145.40 ± 1.33 (5)		
K ²⁰ (mmol/L)	4.18 ± 0.11 (5)	4.10 ± 0.08 (5)		4.34 ± 0.09 (5)		4.16 ± 0.07 (5)		
Cl ²¹ (mmol/L)	102.60 ± 0.51 (5)	102.40 ± 0.51 (5)		102.60 ± 0.81 (5)		103.00 ± 0.45 (5)		
A/G ²²	0.64 ± 0.02 (5)	0.62 ± 0.01 (5)		0.61 ± 0.02 (5)		0.67 ± 0.01 (5)		

() : number

Cholesterol : medium vs. low and high groups (↑) (p<0.05)

Creatinine : control, low and high vs. medium group (↑) (p<0.01)

Magnesium : control vs. low and high dose group (↓) (p<0.05)

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Aspartate aminotransferase; 9, Alanine aminotransferase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Table 14-1. Hematological values of male rats in exposure group

SUMMARY OF HEMATOLOGICAL TESTS EXPOSURE 13WEEKS						
STUDY ID : GT14-00042				SEX : MALE		
GROUP : (mean±S.E)	Control	Low	Medium	High		
WBC ¹ (K/µL)	3.79 ± 0.30 (10)	3.83 ± 0.35 (10)	4.21 ± 0.28 (9)	3.87 ± 0.36 (10)		
RBC ² (M/µL)	9.23 ± 0.07 (10)	9.36 ± 0.04 (10)	9.45 ± 0.11 (9)	9.35 ± 0.07 (10)		
HGB ³ (g/dL)	15.38 ± 0.12 (10)	15.63 ± 0.07 (10)	15.77 ± 0.18 (9)	15.56 ± 0.08 (10)		
HCT ⁴ (%)	44.04 ± 0.39 (10)	45.03 ± 0.32 (10)	45.58 ± 0.51 ^a (9)	44.36 ± 0.26 (10)		
MCV ⁵ (fL)	47.71 ± 0.17 (10)	48.10 ± 0.34 (10)	48.22 ± 0.30 (9)	47.47 ± 0.28 (10)		
MCH ⁶ (pg)	16.66 ± 0.08 (10)	16.71 ± 0.08 (10)	16.69 ± 0.06 (9)	16.64 ± 0.06 (10)		
MCHC ⁷ (g/dL)	34.95 ± 0.12 (10)	34.73 ± 0.20 (10)	34.59 ± 0.20 (9)	35.05 ± 0.17 (10)		
RDW ⁸ (%)	12.90 ± 0.19 (10)	12.83 ± 0.08 (10)	12.93 ± 0.27 (9)	12.69 ± 0.08 (10)		
PLT ⁹ (K/µL)	756.00 ± 36.84 (10)	743.80 ± 25.68 (10)	744.33 ± 13.00 (9)	709.80 ± 22.38 (10)		
MPV ¹⁰ (fL)	6.54 ± 0.23 (10)	6.47 ± 0.30 (10)	6.40 ± 0.38 (9)	6.17 ± 0.25 (10)		
NEP ¹¹ (%)	42.86 ± 2.77 (10)	30.97 ± 2.88 (10)	38.56 ± 4.10 (9)	37.73 ± 3.32 (10)		
LYP ¹² (%)	52.95 ± 2.57 (10)	64.89 ± 2.83 (10)	57.34 ± 3.95 (9)	58.05 ± 3.40 (10)		
MOP ¹³ (%)	1.78 ± 0.10 (10)	1.73 ± 0.13 (10)	1.70 ± 0.17 (9)	1.68 ± 0.15 (10)		
EOP ¹⁴ (%)	1.60 ± 0.21 (10)	1.59 ± 0.15 (10)	1.46 ± 0.08 (9)	1.53 ± 0.17 (10)		
LUP ¹⁵ (%)	0.72 ± 0.11 (10)	0.75 ± 0.12 (10)	0.81 ± 0.06 (9)	0.91 ± 0.07 (10)		
BAP ¹⁶ (%)	0.07 ± 0.02 (10)	0.09 ± 0.02 (10)	0.10 ± 0.04 (9)	0.06 ± 0.02 (10)		
NE ¹⁷ (K/µL)	1.61 ± 0.15 (10)	1.17 ± 0.14 (10)	1.63 ± 0.23 (9)	1.52 ± 0.27 (10)		
LYM ¹⁸ (K/µL)	2.02 ± 0.22 (10)	2.50 ± 0.27 (10)	2.41 ± 0.23 (9)	2.18 ± 0.17 (10)		
MO ¹⁹ (K/µL)	0.07 ± 0.01 (10)	0.07 ± 0.01 (10)	0.07 ± 0.01 (9)	0.07 ± 0.01 (10)		
EO ²⁰ (K/µL)	0.06 ± 0.01 (10)	0.06 ± 0.01 (10)	0.06 ± 0.00 (9)	0.05 ± 0.00 (10)		
LUC ²¹ (K/µL)	0.03 ± 0.01 (10)	0.03 ± 0.01 (10)	0.03 ± 0.00 (9)	0.04 ± 0.01 (10)		
BA ²² (K/µL)	0.00 ± 0.00 (10)	0.00 ± 0.00 (10)	0.00 ± 0.00 (9)	0.00 ± 0.00 (10)		
Reti ²³ (%)	2.40 ± 0.11 (10)	2.40 ± 0.10 (10)	2.32 ± 0.14 (9)	2.26 ± 0.07 (10)		

() : number

a : p<0.05, control and high groups vs. medium dose group(↑)

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Table 14-2. Hematological values of female rats in exposure group

SUMMARY OF HEMATOLOGICAL TESTS EXPOSURE 13WEEKS						
STUDY ID : GT14-00042				SEX : FEMALE		
GROUP : (mean±S.E)	Control	Low	Medium	High		
WBC ¹ (K/µL)	2.93 ± 0.29 (10)	2.49 ± 0.22 (10)	2.71 ± 0.09 (10)	2.75 ± 0.32 (10)		
RBC ² (M/µL)	8.76 ± 0.10 (10)	8.80 ± 0.07 (10)	8.81 ± 0.11 (10)	8.87 ± 0.09 (10)		
HGB ³ (g/dL)	14.30 ± 1.36 (10)	15.65 ± 0.13 (10)	15.61 ± 0.17 (10)	15.73 ± 0.16 (10)		
HCT ⁴ (%)	43.68 ± 0.49 (10)	43.58 ± 0.34 (10)	43.78 ± 0.47 (10)	44.06 ± 0.46 (10)		
MCV ⁵ (fL)	49.86 ± 0.22 (10)	49.57 ± 0.18 (10)	49.70 ± 0.19 (10)	49.65 ± 0.22 (10)		
MCH ⁶ (pg)	16.22 ± 1.51 (10)	17.79 ± 0.04 (10)	17.73 ± 0.05 (10)	17.74 ± 0.06 (10)		
MCHC ⁷ (g/dL)	32.56 ± 3.04 (10)	35.89 ± 0.13 (10)	35.69 ± 0.16 (10)	35.73 ± 0.19 (10)		
RDW ⁸ (%)	11.38 ± 0.06 (10)	11.29 ± 0.05 (10)	11.18 ± 0.07 (10)	11.36 ± 0.08 (10)		
PLT ⁹ (K/µL)	773.10 ± 18.10 (10)	698.50 ± 41.00 (10)	789.40 ± 16.24 (10)	759.50 ± 20.79 (10)		
MPV ¹⁰ (fL)	6.61 ± 0.29 (10)	6.11 ± 0.24 (10)	6.35 ± 0.34 (10)	6.70 ± 0.34 (10)		
NEP ¹¹ (%)	25.01 ± 2.57 (10)	25.18 ± 1.41 (10)	26.22 ± 1.94 (10)	26.78 ± 2.16 (10)		
LYP ¹² (%)	71.49 ± 2.51 (10)	71.24 ± 1.26 (10)	70.21 ± 2.01 (10)	69.03 ± 2.33 (10)		
MOP ¹³ (%)	1.40 ± 0.11 (10)	1.20 ± 0.13 (10)	1.38 ± 0.16 (10)	1.58 ± 0.12 (10)		
EOP ¹⁴ (%)	1.38 ± 0.08 (10)	1.55 ± 0.38 (10)	1.40 ± 0.22 (10)	1.78 ± 0.19 (10)		
LUP ¹⁵ (%)	0.65 ± 0.11 (10)	0.69 ± 0.09 (10)	0.74 ± 0.08 (10)	0.67 ± 0.07 (10)		
BAP ¹⁶ (%)	0.09 ± 0.02 (10)	0.12 ± 0.02 (10)	0.06 ± 0.02 (10)	0.12 ± 0.03 (10)		
NE ¹⁷ (K/µL)	0.70 ± 0.07 (10)	0.61 ± 0.04 (10)	0.71 ± 0.06 (10)	0.69 ± 0.05 (10)		
LYM ¹⁸ (K/µL)	2.13 ± 0.24 (10)	1.79 ± 0.18 (10)	1.90 ± 0.08 (10)	1.95 ± 0.28 (10)		
MO ¹⁹ (K/µL)	0.04 ± 0.01 (10)	0.03 ± 0.00 (10)	0.04 ± 0.01 (10)	0.04 ± 0.01 (10)		
EO ²⁰ (K/µL)	0.04 ± 0.00 (10)	0.04 ± 0.01 (10)	0.04 ± 0.01 (10)	0.05 ± 0.00 (10)		
LUC ²¹ (K/µL)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)	0.02 ± 0.00 (10)		
BA ²² (K/µL)	0.00 ± 0.00 (10)	0.00 ± 0.00 (10)	0.00 ± 0.00 (10)	0.00 ± 0.00 (10)		
Reti ²³ (%)	2.22 ± 0.07 (10)	2.12 ± 0.07 (10)	2.19 ± 0.08 (10)	2.23 ± 0.10 (10)		

() : number

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Table 14-3. Hematological values of male rats in recovery group

SUMMARY OF HEMATOLOGICAL TESTS RECOVERY 13WEEKS								
STUDY ID : GT14-00042								
GROUP : (mean±S.E)	Control	Low		Medium		SEX : MALE		
WBC ¹ (K/µL)	3.51 ± 0.07 (5)	3.42 ± 0.15 (5)		4.14 ± 0.17 (5)		3.88 ± 0.32 (5)		
NE ² (K/µL)	1.16 ± 0.04 (5)	1.13 ± 0.06 (5)		1.81 ± 0.14 ^a (5)		1.36 ± 0.13 (5)		
LY ³ (K/µL)	2.21 ± 0.07 (5)	2.15 ± 0.18 (5)		2.17 ± 0.14 (5)		2.36 ± 0.20 (5)		
MO ⁴ (K/µL)	0.05 ± 0.01 (5)	0.05 ± 0.00 (5)		0.08 ± 0.01 (5)		0.06 ± 0.01 (5)		
EO ⁵ (K/µL)	0.06 ± 0.00 (5)	0.05 ± 0.01 (5)		0.06 ± 0.01 (5)		0.06 ± 0.00 (5)		
LUC ⁶ (K/µL)	0.02 ± 0.00 (5)	0.03 ± 0.00 (5)		0.03 ± 0.00 (5)		0.03 ± 0.01 (5)		
BA ⁷ (K/µL)	0.00 ± 0.00 (5)	0.00 ± 0.00 (5)		0.00 ± 0.00 (5)		0.00 ± 0.00 (5)		
NEP ⁸ (%)	33.10 ± 1.00 (5)	33.44 ± 2.51 (5)		43.76 ± 2.93 ^b (5)		35.16 ± 1.57 (5)		
LYP ⁹ (%)	63.12 ± 1.18 (5)	62.48 ± 2.78 (5)		52.36 ± 2.82 ^c (5)		60.92 ± 1.62 (5)		
MOP ¹⁰ (%)	1.52 ± 0.18 (5)	1.62 ± 0.12 (5)		1.78 ± 0.20 (5)		1.56 ± 0.14 (5)		
EOP ¹¹ (%)	1.62 ± 0.12 (5)	1.50 ± 0.27 (5)		1.42 ± 0.17 (5)		1.62 ± 0.09 (5)		
LUP ¹² (%)	0.56 ± 0.08 (5)	0.82 ± 0.14 (5)		0.64 ± 0.09 (5)		0.74 ± 0.12 (5)		
BAP ¹³ (%)	0.02 ± 0.02 (5)	0.08 ± 0.04 (5)		0.06 ± 0.02 (5)		0.04 ± 0.02 (5)		
RBC ¹⁴ (M/µL)	9.62 ± 0.12 (5)	9.64 ± 0.08 (5)		9.71 ± 0.11 (5)		9.75 ± 0.12 (5)		
Hb ¹⁵ (g/dL)	15.02 ± 0.60 (5)	15.60 ± 0.14 (5)		15.62 ± 0.17 (5)		15.72 ± 0.14 (5)		
HCT ¹⁶ (%)	46.56 ± 0.35 (5)	46.70 ± 0.49 (5)		47.38 ± 0.92 (5)		47.54 ± 0.62 (5)		
MCV ¹⁷ (fL)	48.38 ± 0.32 (5)	48.46 ± 0.36 (5)		48.80 ± 0.73 (5)		48.76 ± 0.36 (5)		
MCH ¹⁸ (pg)	15.62 ± 0.68 (5)	16.18 ± 0.18 (5)		16.10 ± 0.05 (5)		16.10 ± 0.04 (5)		
MCHC ¹⁹ (g/dL)	32.28 ± 1.40 (5)	33.40 ± 0.29 (5)		33.02 ± 0.47 (5)		33.08 ± 0.22 (5)		
RDW ²⁰ (%)	13.00 ± 0.11 (5)	13.06 ± 0.18 (5)		12.90 ± 0.15 (5)		13.04 ± 0.18 (5)		
PLT ²¹ (K/µL)	687.40 ± 32.52 (5)	729.80 ± 41.84 (5)		696.20 ± 52.55 (5)		670.60 ± 58.18 (5)		
MPV ²² (fL)	8.16 ± 0.43 (5)	8.30 ± 0.59 (5)		8.02 ± 0.51 (5)		7.94 ± 0.71 (5)		
Reti ²³	2.30 ± 0.13 (5)	2.29 ± 0.09 (5)		2.18 ± 0.06 (5)		2.26 ± 0.22 (5)		

() : animal number

a : p<0.01, control, low and high vs. medium dose group (↑)

b : p<0.01, control, low and high vs. medium dose group (↑)

c : p<0.05, control, low and high vs. medium dose group (↓)

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Table 15-1. Blood coagulation test of male rats in exposure group

SUMMARY OF BLOOD COAGULATION EXPOSURE 13WEEKS				
STUDY ID	SEX : MALE			
GROUP (mean±S.E)	Control	Low	Medium	High
APTT [†]	20.10 ± 0.44 (10)	20.41 ± 0.54 (10)	19.72 ± 0.65 (9)	19.75 ± 0.34 (10)
PT [‡]	8.84 ± 0.08 (10)	9.06 ± 0.13 (10)	9.12 ± 0.15 (9)	9.12 ± 0.09 (10)

() : number

† : activated partial thromboplastin time (sec)

‡ : prothrombin time (sec)

Table 15-2. Blood coagulation test of female rats in exposure group

SUMMARY OF BLOOD COAGULATION EXPOSURE 13WEEKS				
STUDY ID	SEX : FEMALE			
GROUP (mean±S.E)	Control	Low	Medium	High
APTT [†]	21.38 ± 0.33 (10)	20.85 ± 0.46 (10)	21.85 ± 0.37 (10)	21.45 ± 0.48 (10)
PT [‡]	9.12 ± 0.13 (10)	9.17 ± 0.19 (10)	9.34 ± 0.22 (10)	9.34 ± 0.16 (10)

() : number

† : activated partial thromboplastin time (sec)

‡ : prothrombin time (sec)

Table 15-3. Blood coagulation test of male rats in recovery group

SUMMARY OF BLOOD COAGULATION RECOVERY 13WEEKS				
STUDY ID	SEX : MALE			
GROUP (mean±S.E)	Control	Low	Medium	High
APTT [†]	19.26 ± 0.49 (5)	19.22 ± 0.56 (5)	19.60 ± 0.58 (5)	18.84 ± 0.38 (5)
PT [‡]	6.93 ± 0.17 (5)	6.96 ± 0.26 (5)	7.62 ± 0.11 ^a (5)	7.56 ± 0.04 ^a (5)

() : animal number

a : p<0.05, control and low vs. medium and high groups (↑)

† : activated partial thromboplastin time (sec)

‡ : prothrombin time (sec)

Table 16-1. Histopathological finding of male rats in exposure group

SUMMARY OF HISTOPATHOLOGICAL FINDINGS			
EXPOSURE 13WEEKS			
STUDY : GT14-00042		SEX : MALE	
ORGANS	SIGNS	GROUP(mg/m ³)	
		CE(0)	LE(0.2)
		N (%)	N (%)
Liver	No remarkable lesions	10/10 (100)	
	Remarkable lesions	0/10 (0)	0/10 (0)
	-Congestion	± 0/10 (0)	0/10 (0)
Kidney	No remarkable lesions	8/10 (80)	8/10 (80)
	Remarkable lesions	2/10 (20)	2/10 (20)
	-Mineralization, tubule, focal, cortex	± 0/10 (0)	0/10 (0)
	-Basophilic tubules, focal, cortex	± 2/10 (20)	2/10 (20)
Adrenal gl.	No remarkable lesions	10/10 (100)	10/10 (100)
Urinary bladder	No remarkable lesions	10/10 (100)	10/10 (100)
Spleen	No remarkable lesions	10/10 (100)	10/10 (100)
Pancreas	No remarkable lesions	10/10 (100)	10/10 (100)
Thymus	No remarkable lesions	10/10 (100)	10/10 (100)
Thyroid	No remarkable lesions	10/10 (100)	10/10 (100)
Parathyroid	No remarkable lesions	10/10 (100)	10/10 (100)
Trachea	No remarkable lesions	10/10 (100)	10/10 (100)
Esophagus	No remarkable lesions	10/10 (100)	10/10 (100)
Tongue	No remarkable lesions	10/10 (100)	10/10 (100)
	No remarkable lesions	10/10 (100)	10/10 (100)
	Remarkable lesions	0/10 (0)	0/10 (0)
Lung	-Hemorrhage, focal, alveolar	± 0/10 (0)	0/10 (0)
	-Inflammation, focal, alveolar, with fibrosis	+ 0/10 (0)	0/10 (0)
	-Alveolar macrophage, focal	± 0/10 (0)	0/10 (0)
Heart	No remarkable lesions	10/10 (100)	10/10 (100)
Submandibular LN	No remarkable lesions	10/10 (100)	10/10 (100)
Mesenteric LN	No remarkable lesions	10/10 (100)	10/10 (100)
Salivary gl. submandibular	No remarkable lesions	10/10 (100)	10/10 (100)
Salivary gl. sublingual	No remarkable lesions	10/10 (100)	10/10 (100)
Salivary gl. parotid	No remarkable lesions	10/10 (100)	10/10 (100)
Stomach	No remarkable lesions	10/10 (100)	10/10 (100)
Duodenum	No remarkable lesions	10/10 (100)	10/10 (100)
Ileum	No remarkable lesions	10/10 (100)	10/10 (100)
Jejunum	No remarkable lesions	10/10 (100)	10/10 (100)

N: Number of animals with the signs / Number of examined animals, gl.=gland

Grade) ±: minimal, +: mild, ++: moderate

Table 16-1. Histopathological finding of male rats in exposure group (continued)

		SUMMARY OF HISTOPATHOLOGICAL FINDINGS EXPOSURE 13WEEKS			
STUDY : GT14-00042		SEX : MALE			
ORGANS	SIGNS	GROUP(mg/m ³)			
		CE(0) N (%)	LE(0.2) N (%)	ME(0.5) N (%)	HE(1.0) N (%)
Cecum	No remarkable lesions	10/10 (100)			10/10 (100)
Colon	No remarkable lesions	10/10 (100)			10/10 (100)
Rectum	No remarkable lesions	10/10 (100)			10/10 (100)
Skin	No remarkable lesions	10/10 (100)			10/10 (100)
Mammary gl.	No remarkable lesions	10/10 (100)			10/10 (100)
Eye	No remarkable lesions	10/10 (100)			10/10 (100)
Harderian gl.	No remarkable lesions	10/10 (100)			10/10 (100)
Brain	No remarkable lesions	10/10 (100)			10/10 (100)
	No remarkable lesions	8/10 (80)			10/10 (100)
Pituitary	Remarkable lesions	2/10 (20)			0/10 (0)
	-Cyst, pars intermedia	± 2/10 (20)			0/10 (0)
Femur	No remarkable lesions	10/10 (100)			10/10 (100)
Spinal cord	No remarkable lesions	10/10 (100)			9/9 (100)
Skeletal muscle	No remarkable lesions	10/10 (100)			10/10 (100)
Sciatic nerve	No remarkable lesions	10/10 (100)			10/10 (100)
Testis	No remarkable lesions	10/10 (100)			10/10 (100)
Epididymis	No remarkable lesions	10/10 (100)			10/10 (100)
	No remarkable lesions	9/10 (90)			10/10 (100)
Prostate	Remarkable lesions	1/10 (10)			0/10 (0)
	-Inflammation, suppurative	+ 1/10 (10)			0/10 (0)
Seminal vesicle	No remarkable lesions	10/10 (100)			10/10 (100)
Coagulating gl.	No remarkable lesions	10/10 (100)			10/10 (100)
Sternum	No remarkable lesions	10/10 (100)			10/10 (100)
Nasal cavity	No remarkable lesions	10/10 (100)	10/10 (100)	9/9 (100)	10/10 (100)

N: Number of animals with the signs / Number of examined animals, gl.=gland, LN=lymph node
Grade) ±: minimal, +: mild

Table 16-2. Histopathological finding of dead animal in male rats in exposure group

		SUMMARY OF HISTOPATHOLOGICAL FINDINGS			
		EXPOSURE 13WEEKS			
STUDY : GT14-00042		SEX : MALE			
ORGANS	SIGNS	CE(0) N (%)	LE(0.2) N (%)	ME(0.5) N (%)	HE(1.0) N (%)
	No remarkable lesions			0/1 (0)	
Liver	Remarkable lesions			1/1 (100)	
	-Congestion	±		1/1 (100)	
	No remarkable lesions			0/1 (0)	
Kidney	Remarkable lesions			1/1 (100)	
	-Mineralization, tubule, focal, cortex	±		1/1 (100)	
Adrenal gl.	No remarkable lesions			1/1 (100)	
	No remarkable lesions			0/1 (0)	
Urinary bladder	Remarkable lesions			1/1 (100)	
	-Flattening, urothelial, with inflammation	++		1/1 (100)	
Spleen	No remarkable lesions			1/1 (100)	
Pancreas	No remarkable lesions			1/1 (100)	
Thymus	No remarkable lesions			1/1 (100)	
Thyroid	No remarkable lesions			1/1 (100)	
Parathyroid	No remarkable lesions			1/1 (100)	
Trachea	No remarkable lesions			1/1 (100)	
Esophagus	No remarkable lesions			1/1 (100)	
Tongue	No remarkable lesions			1/1 (100)	
	No remarkable lesions			0/1 (0)	
Lung	Remarkable lesions			1/1 (100)	
	-Congestion	±		1/1 (100)	
Heart	No remarkable lesions			1/1 (100)	
Submandibular LN	No remarkable lesions			1/1 (100)	
Mesenteric LN	No remarkable lesions			1/1 (100)	
Salivary gl. submandibular	No remarkable lesions			1/1 (100)	
Salivary gl. sublingual	No remarkable lesions			1/1 (100)	
Salivary gl. parotid	No remarkable lesions			1/1 (100)	
Stomach	No remarkable lesions			1/1 (100)	
Duodenum	No remarkable lesions			1/1 (100)	
Ileum	No remarkable lesions			1/1 (100)	
Jejunum	No remarkable lesions			1/1 (100)	

N: Number of animals with the signs / Number of examined animals, gl.=gland

Grade) ±: minimal, +: mild, ++: moderate

Table 16-2. Histopathological finding of dead animal in male rats in exposure group
(Continued)

SUMMARY OF HISTOPATHOLOGICAL FINDINGS					
EXPOSURE 13WEEKS					
STUDY : GT14-00042	ORGANS	SEX : MALE			
		GROUP(mg/m ³)	CE(0)	LE(0.2)	ME(0.5)
		N (%)	N (%)	N (%)	HE(1.0) N (%)
Cecum	No remarkable lesions				1/1 (100)
Colon	No remarkable lesions				1/1 (100)
Rectum	No remarkable lesions				1/1 (100)
Skin	No remarkable lesions				1/1 (100)
Mammary gl.	No remarkable lesions				1/1 (100)
Eye	No remarkable lesions				1/1 (100)
Harderian gl.	No remarkable lesions				1/1 (100)
Brain	No remarkable lesions				1/1 (100)
Pituitary	No remarkable lesions				1/1 (100)
Femur	No remarkable lesions				1/1 (100)
Spinal cord	No remarkable lesions				1/1 (100)
Skeletal muscle	No remarkable lesions				1/1 (100)
Sciatic nerve	No remarkable lesions				1/1 (100)
Testis	No remarkable lesions				1/1 (100)
Epididymis	No remarkable lesions				1/1 (100)
	No remarkable lesions				0/1 (0)
Prostate	Remarkable lesions				1/1 (100)
	-Edema/hemorrhage, with inflammation	+			1/1 (100)
Seminal vesicle	No remarkable lesions				1/1 (100)
Coagulating gl.	No remarkable lesions				1/1 (100)
Sternum	No remarkable lesions				1/1 (100)
Nasal cavity	No remarkable lesions				1/1 (100)

N: Number of animals with the signs / Number of examined animals, gl.=gland, LN=lymph node
Grade) ±: minimal, +: mild

Table 16-3. Histopathological finding of female rats in exposure group

SUMMARY OF HISTOPATHOLOGICAL FINDINGS			
EXPOSURE 13WEEKS			
STUDY : GT14-00042		SEX : MALE	
ORGANS	SIGNS	GROUP(mg/m ³)	
		CE(0)	LE(0.2)
		N (%)	N (%)
Liver	No remarkable lesions	10/10 (100)	
	Remarkable lesions	0/10 (0)	
	-Degeneration/necrosis, focal	± 0/10 (0)	
Kidney	No remarkable lesions	10/10 (100)	
Adrenal gl.	No remarkable lesions	10/10 (100)	
Urinary bladder	No remarkable lesions	10/10 (100)	
Spleen	No remarkable lesions	10/10 (100)	
Pancreas	No remarkable lesions	10/10 (100)	
Thymus	No remarkable lesions	10/10 (100)	
Thyroid	No remarkable lesions	10/10 (100)	
Parathyroid	No remarkable lesions	9/9 (100)	
Trachea	No remarkable lesions	10/10 (100)	
Esophagus	No remarkable lesions	10/10 (100)	
Tongue	No remarkable lesions	10/10 (100)	
Lung	No remarkable lesions	10/10 (100)	10/10 (100)
		10/10 (100)	10/10 (100)
Heart	No remarkable lesions	10/10 (100)	
Submandibular LN	No remarkable lesions	10/10 (100)	
Mesenteric LN	No remarkable lesions	10/10 (100)	
Salivary gl. submandibular	No remarkable lesions	10/10 (100)	
Salivary gl. sublingual	No remarkable lesions	10/10 (100)	
Salivary gl. parotid	No remarkable lesions	10/10 (100)	
Stomach	No remarkable lesions	10/10 (100)	
Duodenum	No remarkable lesions	10/10 (100)	
Ileum	No remarkable lesions	10/10 (100)	
Jejunum	No remarkable lesions	10/10 (100)	
Cecum	No remarkable lesions	10/10 (100)	
Colon	No remarkable lesions	10/10 (100)	
Rectum	No remarkable lesions	10/10 (100)	
Skin	No remarkable lesions	10/10 (100)	
Mammary gl.	No remarkable lesions	10/10 (100)	
Eye	No remarkable lesions	10/10 (100)	
	No remarkable lesions	10/10 (100)	
Harderian gl.	Remarkable lesions	0/10 (0)	
	-Cell infiltration, mononuclear, focal	± 0/10 (0)	
			1/10 (10)

N: Number of animals with the signs / Number of examined animals, gl.=gland, LN=lymph node
Grade) ±: minimal

Table 16-3. Histopathological finding of female rats in exposure group (continued)

		SUMMARY OF HISTOPATHOLOGICAL FINDINGS			
		EXPOSURE 13WEEKS			
ORGANS	SIGNS	SEX : MALE			
		CE(0) N (%)	LE(0.2) N (%)	ME(0.5) N (%)	HE(1.0) N (%)
Brain	No remarkable lesions	10/10 (100)			10/10 (100)
	No remarkable lesions	9/10 (90)			10/10 (100)
Pituitary	Remarkable lesions -Cyst, pars intermedia	1/10 (10) ± 1/10 (10)			0/10 (0) 0/10 (0)
Femur	No remarkable lesions	10/10 (100)			10/10 (100)
Spinal cord	No remarkable lesions	10/10 (100)			10/10 (100)
Skeletal muscle	No remarkable lesions	10/10 (100)			10/10 (100)
Sciatic nerve	No remarkable lesions	10/10 (100)			10/10 (100)
Ovary	No remarkable lesions	10/10 (100)			10/10 (100)
Uterus	No remarkable lesions	10/10 (100)			10/10 (100)
Vagina	No remarkable lesions	10/10 (100)			10/10 (100)
Sternum	No remarkable lesions	10/10 (100)			10/10 (100)
Nasal cavity	No remarkable lesions	10/10 (100)	10/10 (100)	10/10 (100)	10/10 (100)

N: Number of animals with the signs / Number of examined animals

Grade) ±: minimal

Table 16-4. Histopathological finding of male rats in recovery group

		SUMMARY OF HISTOPATHOLOGICAL FINDINGS			
		RECOVERY 13WEEKS			
STUDY : GT14-00042		SEX : MALE			
ORGANS	SIGNS	GROUP(mg/m ³)			
		CR(0)	LR(0.2)	MR(0.5)	HR(1.0)
		N (%)	N (%)	N (%)	N (%)
Liver	No remarkable lesions	5/5 (100)			5/5 (100)
	Remarkable lesions	0/5 (0)			0/5 (0)
Kidney	No remarkable lesions	0/5 (0)			0/5 (0)
	Remarkable lesions	5/5 (100)			5/5 (100)
	-Basophilic tubules, focal, cortex	±	5/5 (100)		5/5 (100)
	-Cell infiltration, mononuclear, perivasucular	±	0/5 (0)		1/5 (20)
	-Hyaline droplet	±	1/5 (20)		1/5 (20)
Adrenal gl.	No remarkable lesions	5/5 (100)			5/5 (100)
Urinary bladder	No remarkable lesions	5/5 (100)			5/5 (100)
Spleen	No remarkable lesions	5/5 (100)			5/5 (100)
Pancreas	No remarkable lesions	5/5 (100)			5/5 (100)
Thymus	No remarkable lesions	5/5 (100)			5/5 (100)
Thyroid	No remarkable lesions	5/5 (100)			5/5 (100)
Parathyroid	No remarkable lesions	5/5 (100)			5/5 (100)
Trachea	No remarkable lesions	5/5 (100)			5/5 (100)
Esophagus	No remarkable lesions	5/5 (100)			5/5 (100)
Tongue	No remarkable lesions	5/5 (100)			5/5 (100)
	No remarkable lesions	5/5 (100)	5/5 (100)	3/5 (60)	5/5 (100)
Lung	Remarkable lesions	0/5 (0)	0/5 (0)	2/5 (40)	0/5 (0)
	-Alveolar macrophage, focal	±	0/5 (0)	0/5 (0)	2/5 (40)
Heart	No remarkable lesions	5/5 (100)			5/5 (100)
Submandibular LN	No remarkable lesions	5/5 (100)			5/5 (100)
Mesenteric LN	No remarkable lesions	5/5 (100)			5/5 (100)
Salivary gl. submandibular	No remarkable lesions	5/5 (100)			5/5 (100)
Salivary gl. sublingual	No remarkable lesions	5/5 (100)			5/5 (100)
Salivary gl. parotid	No remarkable lesions	5/5 (100)			5/5 (100)
Stomach	No remarkable lesions	5/5 (100)			5/5 (100)
Duodenum	No remarkable lesions	5/5 (100)			5/5 (100)
Ileum	No remarkable lesions	5/5 (100)			5/5 (100)
Jejunum	No remarkable lesions	5/5 (100)			5/5 (100)

N: Number of animals with the signs / Number of examined animals, gl.=gland

Grade) ±: minimal

Table 16-4. Histopathological finding of male rats in recovery group (continued)

		SUMMARY OF HISTOPATHOLOGICAL FINDINGS			
		RECOVERY 13WEEKS			
STUDY : GT14-00042		SEX : MALE			
ORGANS	SIGNS	CR(0) N (%)	LR(0.2) N (%)	MR(0.5) N (%)	HR(1.0) N (%)
Cecum	No remarkable lesions	5/5 (100)			5/5 (100)
Colon	No remarkable lesions	5/5 (100)			5/5 (100)
Rectum	No remarkable lesions	5/5 (100)			5/5 (100)
Skin	No remarkable lesions	5/5 (100)			5/5 (100)
Mammary gl.	No remarkable lesions	5/5 (100)			5/5 (100)
Eye	No remarkable lesions	5/5 (100)			5/5 (100)
	No remarkable lesions	4/5 (80)			5/5 (100)
Harderian gl.	Remarkable lesions -Cell infiltration, lymphocytic, focal, interstitial	1/5 (20) ± 1/5 (20)			0/5 (0) 0/5 (0)
Brain	No remarkable lesions	5/5 (100)			5/5 (100)
Pituitary	No remarkable lesions	5/5 (100)			5/5 (100)
Femur	No remarkable lesions	5/5 (100)			5/5 (100)
Spinal cord	No remarkable lesions	5/5 (100)			5/5 (100)
Skeletal muscle	No remarkable lesions	5/5 (100)			5/5 (100)
Sciatic nerve	No remarkable lesions	5/5 (100)			5/5 (100)
	No remarkable lesions	5/5 (100)	0/1 (0)		5/5 (100)
Testis	Remarkable lesions -Atrophy, seminiferous, unilateral	0/5 (0) ++ 0/5 (0)	1/1 (100)		0/5 (0) 0/5 (0)
	No remarkable lesions	5/5 (100)	0/1 (0)		5/5 (100)
	Remarkable lesions -Hypoplasia/degeneration, epididymal duct, unilateral	0/5 (0) + 0/5 (0)	1/1 (100)		0/5 (0) 0/5 (0)
Epididymis	-Decreased, spermatozoa, in lumen, unilateral	+ 0/5 (0)	1/1 (100)		0/5 (0)
Prostate	No remarkable lesions	5/5 (100)			5/5 (100)
Seminal vesicle	No remarkable lesions	5/5 (100)			5/5 (100)
Coagulating gl.	No remarkable lesions	5/5 (100)			5/5 (100)
Sternum	No remarkable lesions	5/5 (100)			5/5 (100)
Nasal cavity	No remarkable lesions	5/5 (100)	5/5 (100)	5/5 (100)	5/5 (100)

N: Number of animals with the signs / Number of examined animals, gl.=gland, LN=lymph node

Grade) ±: minimal, +: mild, ++: moderate

Table 17-1. Bronchoalveolar lavage of male rats in exposure group

SUMMARY OF BRONCOALVEOLAR LAVAGE TEST							
EXPOSURE 13WEEKS							
STUDY : GT14-00042				SEX : MALE			
GROUP: (mean±S.E)	Control	Low	Medium	High			
Total cell ¹	0.96 ± 0.09 (5)	0.96 ± 0.12 (5)	0.91 ± 0.05 (5)	0.97 ± 0.06 (5)			
Macrophage ²	0.92 ± 0.09 (5)	0.90 ± 0.12 (5)	0.84 ± 0.04 (5)	0.90 ± 0.06 (5)			
PMN ³	0.03 ± 0.01 (5)	0.03 ± 0.00 (5)	0.04 ± 0.01 (5)	0.04 ± 0.01 (5)			
Lymphocyte ⁴	0.02 ± 0.00 (5)	0.02 ± 0.00 (5)	0.03 ± 0.01 (5)	0.03 ± 0.01 (5)			
TP ⁵	6.24 ± 2.25 (5)	4.08 ± 1.19 (5)	2.52 ± 0.65 (5)	4.08 ± 1.06 (5)			
ALB ⁶	14.36 ± 0.85 (5)	13.40 ± 0.66 (5)	13.56 ± 1.34 (5)	13.74 ± 1.17 (5)			
LDH ⁷	10.00 ± 1.23 (5)	11.20 ± 0.86 (5)	11.00 ± 1.34 (5)	10.20 ± 0.97 (5)			

() : animal number

1, Total cell count ($\times 10^3/\mu\text{l}$); 2, Macrophage ($\times 10^3/\mu\text{l}$); 3, Polymorphonuclear cell ($\times 10^3/\mu\text{l}$); 4, Lymphocyte ($\times 10^3/\mu\text{l}$); 5, Total protein (mg/dl); 6, Albumin (mg/dl); 7, Lactate Dehydrogenase (IU/l)

Table 17-2. Bronchoalveolar lavage of female rats in exposure group

SUMMARY OF BRONCOALVEOLAR LAVAGE TEST							
EXPOSURE 13WEEKS							
STUDY : GT14-00042				SEX : FEMALE			
GROUP: (mean±S.E)	Control	Low	Medium	High			
Total cell ¹	0.63 ± 0.05 (5)	0.59 ± 0.04 (5)	0.59 ± 0.03 (5)	0.59 ± 0.06 (5)			
Macrophage ²	0.61 ± 0.04 (5)	0.56 ± 0.04 (5)	0.55 ± 0.03 (5)	0.55 ± 0.06 (5)			
PMN ³	0.01 ± 0.00 (5)	0.02 ± 0.00 (5)	0.02 ± 0.00 (5)	0.02 ± 0.00 (5)			
Lymphocyte ⁴	0.01 ± 0.00 (5)	0.01 ± 0.00 (5)	0.01 ± 0.00 (5)	0.01 ± 0.00 (5)			
TP ⁵	2.78 ± 0.82 (5)	1.70 ± 0.30 (5)	7.88 ± 6.30 (5)	7.96 ± 3.04 (5)			
ALB ⁶	14.04 ± 1.66 (5)	11.98 ± 0.58 (5)	29.24 ± 14.40 (5)	18.68 ± 5.12 (5)			
LDH ⁷	17.00 ± 1.90 (5)	16.60 ± 2.48 (5)	18.20 ± 1.72 (5)	20.00 ± 1.61 (5)			

() : animal number

1, Total cell count ($\times 10^3/\mu\text{l}$); 2, Macrophage ($\times 10^3/\mu\text{l}$); 3, Polymorphonuclear cell ($\times 10^3/\mu\text{l}$); 4, Lymphocyte ($\times 10^3/\mu\text{l}$); 5, Total protein (mg/dl); 6, Albumin (mg/dl); 7, Lactate Dehydrogenase (IU/l)

Table 17-3. Bronchoalveolar lavage of male rats in recovery group

SUMMARY OF BRONCOALVEOLAR LAVAGE TEST RECOVERY 13WEEKS							
STUDY ID : GT14-00042				SEX : MALE			
GROUP: (mean±S.E)	Control	Low	Medium	High			
Total cell ¹	0.87 ± 0.20 (5)	0.62 ± 0.13 (5)	0.50 ± 0.14 (5)	0.41 ± 0.06 (5)			
Macrophage ²	0.82 ± 0.19 (5)	0.59 ± 0.12 (5)	0.48 ± 0.13 (5)	0.39 ± 0.05 (5)			
PMN ³	0.04 ± 0.01 (5)	0.02 ± 0.01 (5)	0.01 ± 0.01 (5)	0.01 ± 0.00 (5)			
Lymphocyte ⁴	0.01 ± 0.00 (5)	0.01 ± 0.00 (5)	0.01 ± 0.00 (5)	0.01 ± 0.00 (5)			
TP ⁵	1.14 ± 0.39 (5)	2.82 ± 1.60 (5)	2.10 ± 1.05 (5)	0.52 ± 0.14 (5)			
ALB ⁶	5.98 ± 1.85 (5)	4.72 ± 0.19 (5)	4.20 ± 0.61 (5)	2.84 ± 0.39 (5)			
LDH ⁷	14.00 ± 1.92 (5)	10.20 ± 1.16 (5)	17.40 ± 6.93 (5)	9.00 ± 1.58 (5)			

() : animal number

1, Total cell count ($\times 10^3/\mu\text{l}$); 2, Macrophage ($\times 10^3/\mu\text{l}$); 3, Polymorphonuclear cell ($\times 10^3/\mu\text{l}$); 4, Lymphocyte ($\times 10^3/\mu\text{l}$); 5, Total protein (mg/dl); 6, Albumin (mg/dl); 7, Lactate Dehydrogenase (IU/ ℓ)

8. FIGURE

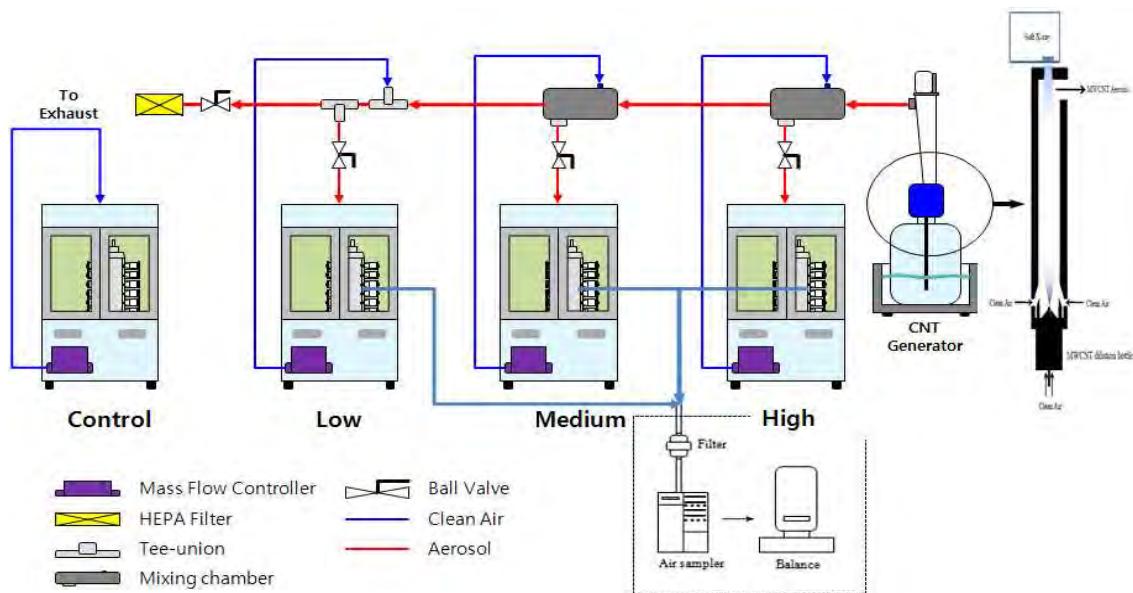


Figure 1. Schematic diagram of inhalation toxicity study

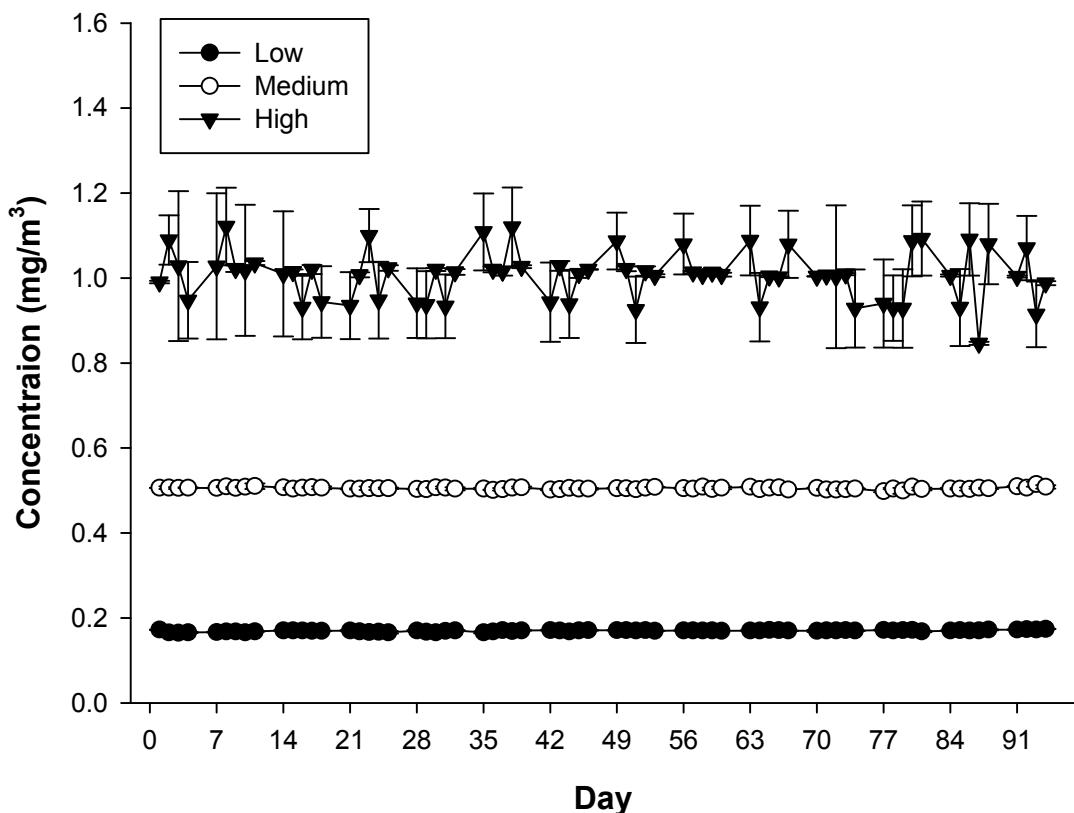


Figure 2. Daily chamber concentration of test substance

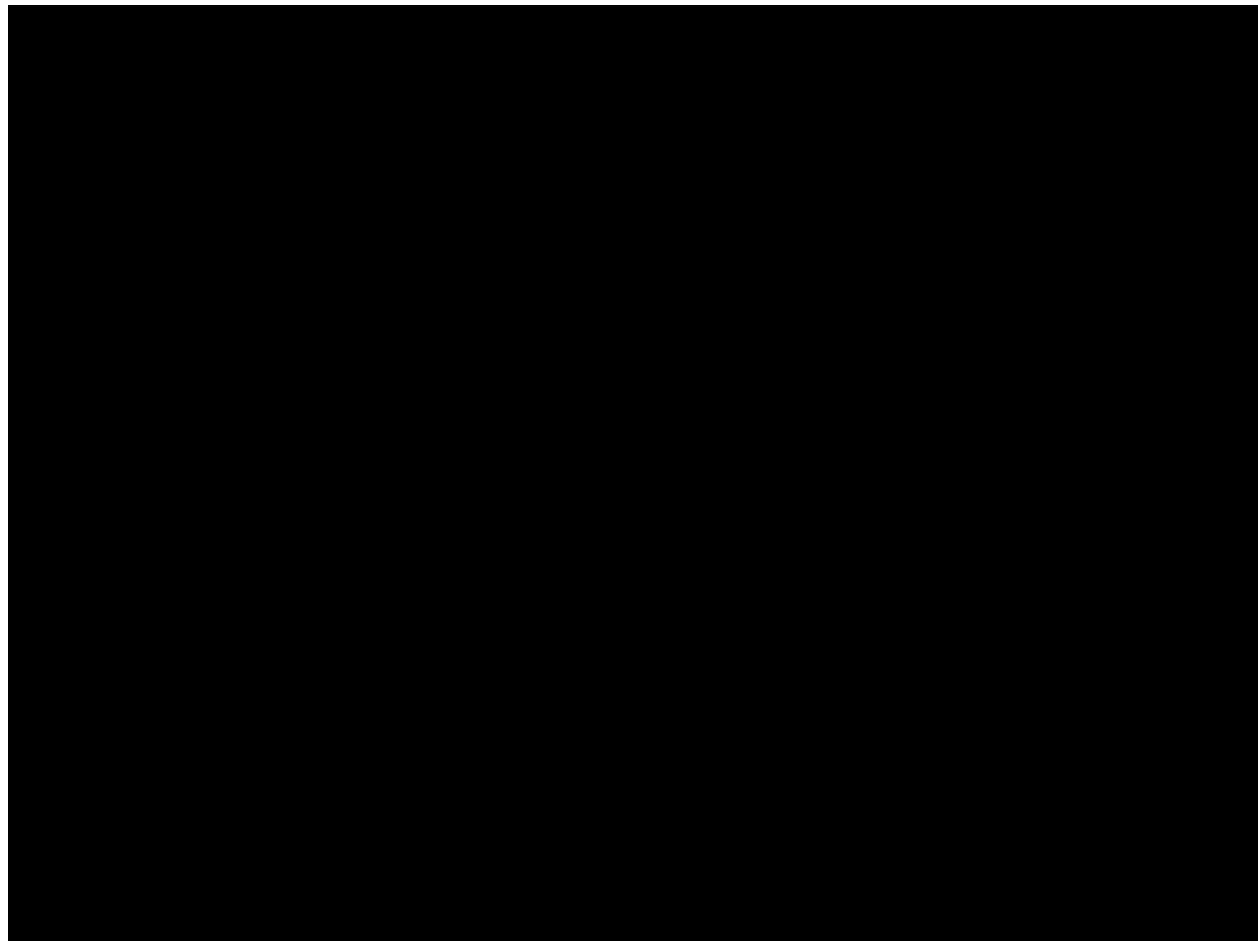


Figure 3. MWCNT by TEM

A ~ C : Scanning Transmission Electron Microscope ($\times 100,000$)

D : EDX spectrometer

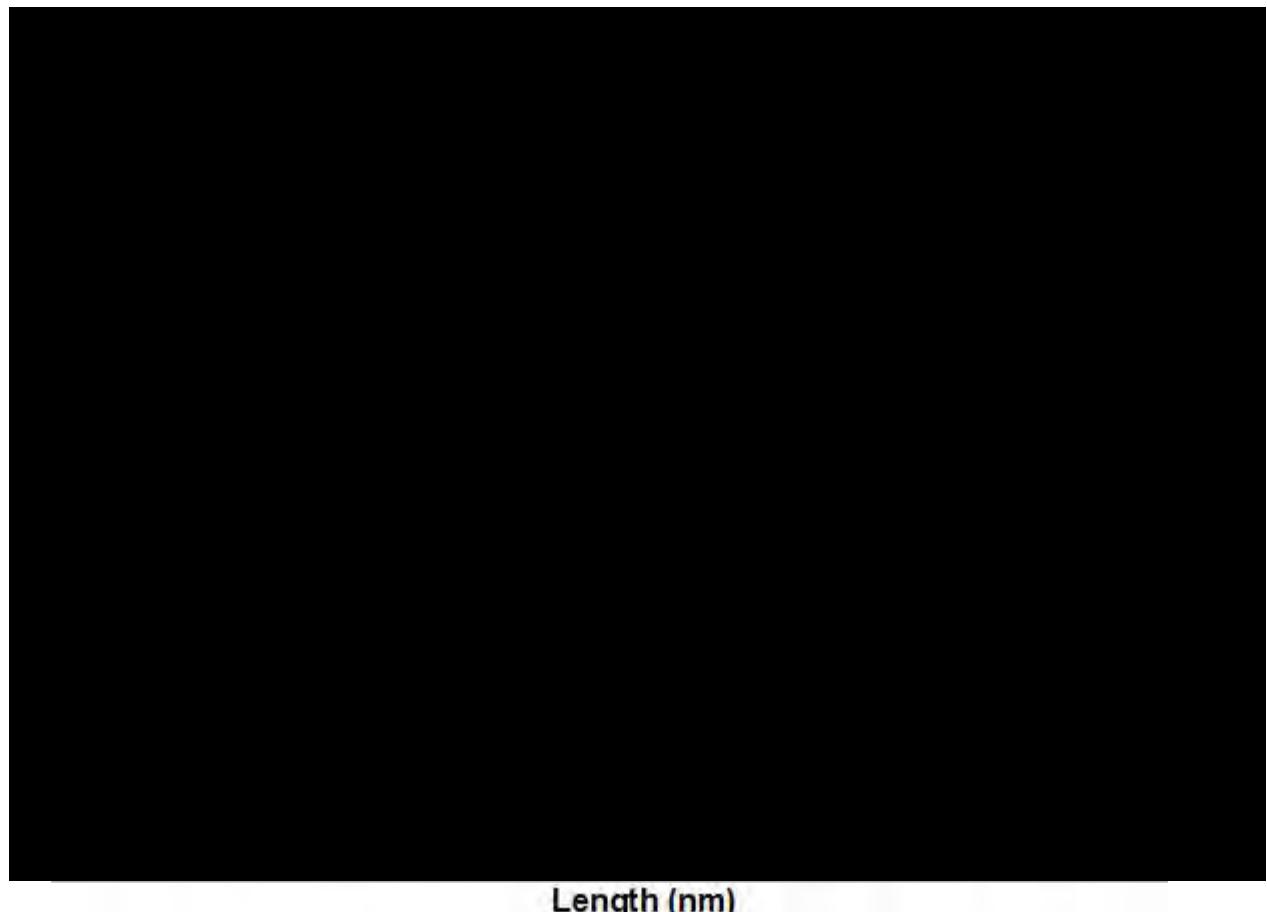


Figure 4. Cumulative mean length of MWCNT

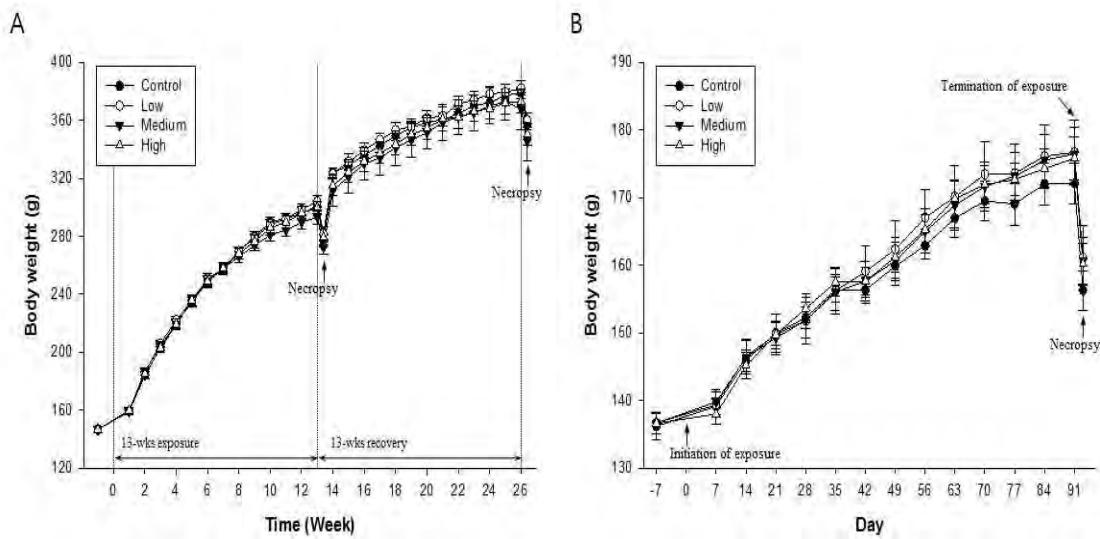


Figure 5. Body weight changes

A : male, B : female

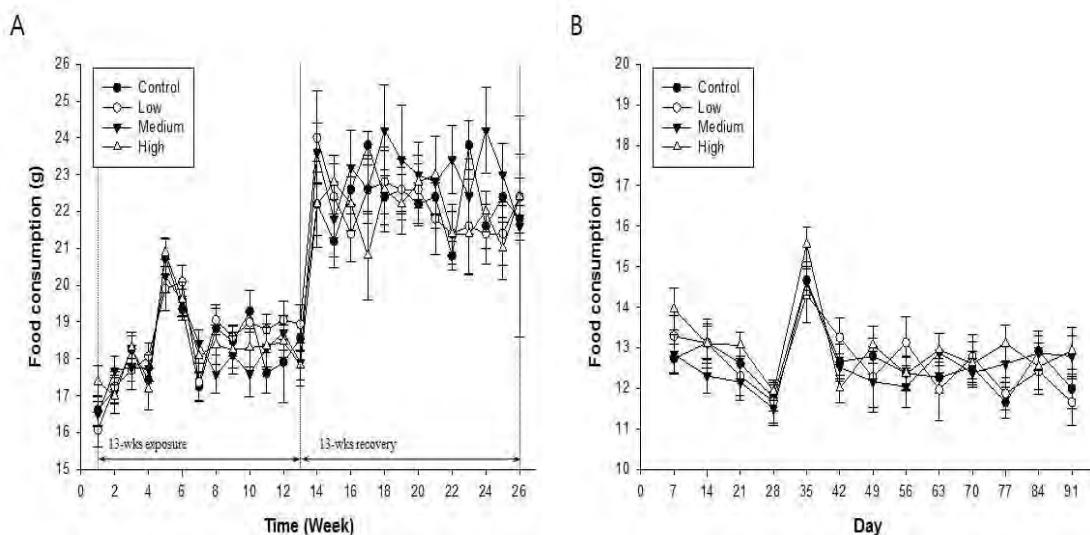


Figure 6. Food consumption changes

A : male, B : female

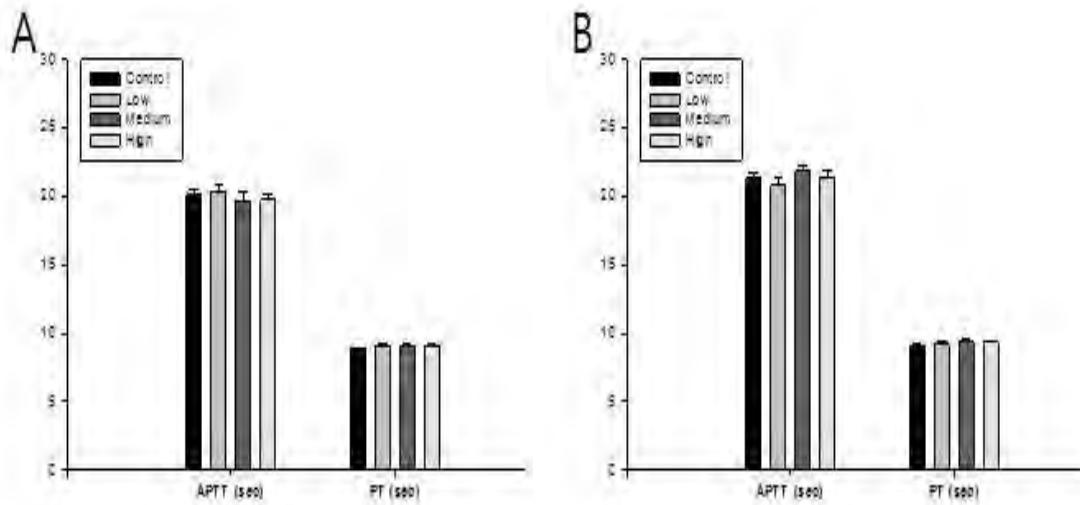
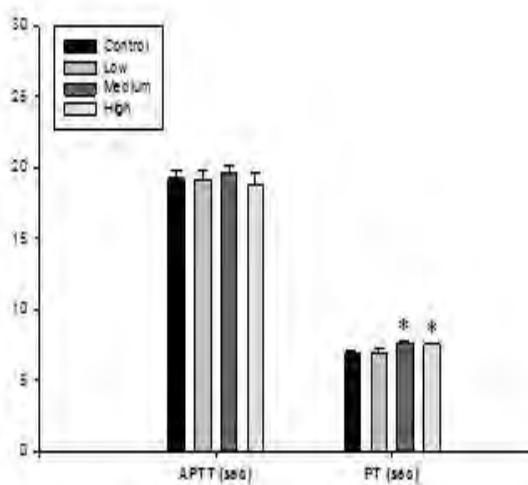


Figure 7-1. Blood clotting time in exposure group

A : male, B : female



Figuer 7-2. Blood clotting time of male rats in recovery group

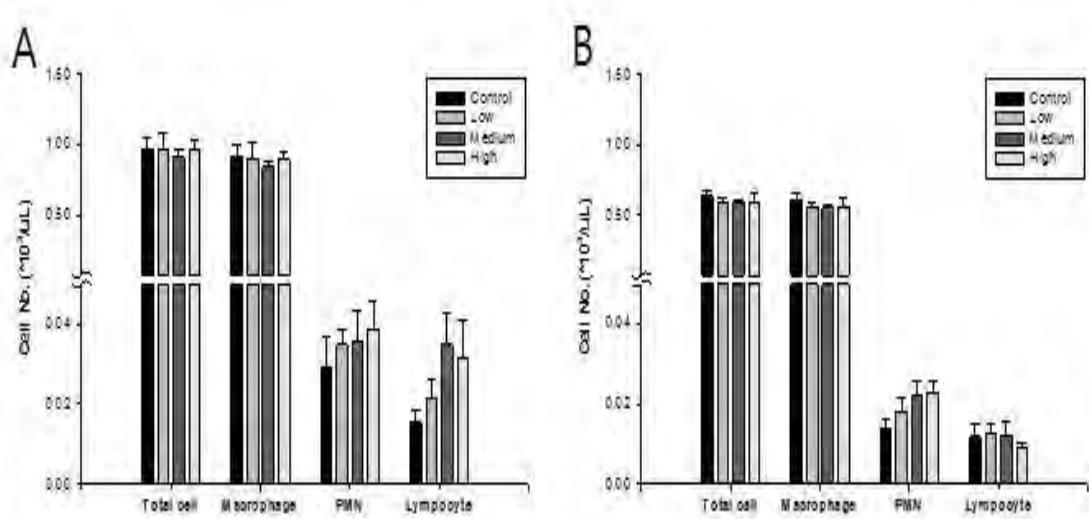


Figure 8-1. Cell count of BAL fluid in exposure group

A : male, B : female

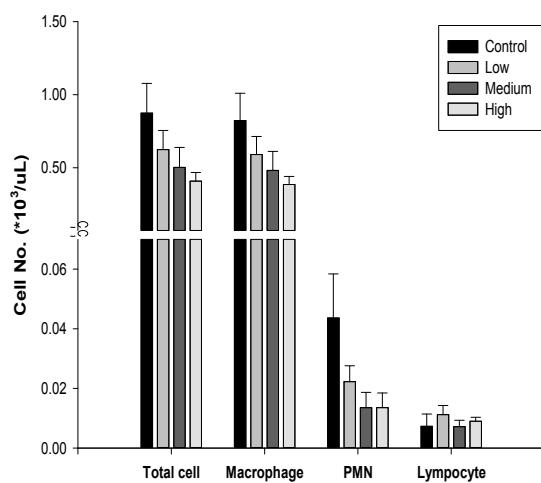


Figure 8-2. Cell count of BAL fluid in recovery group

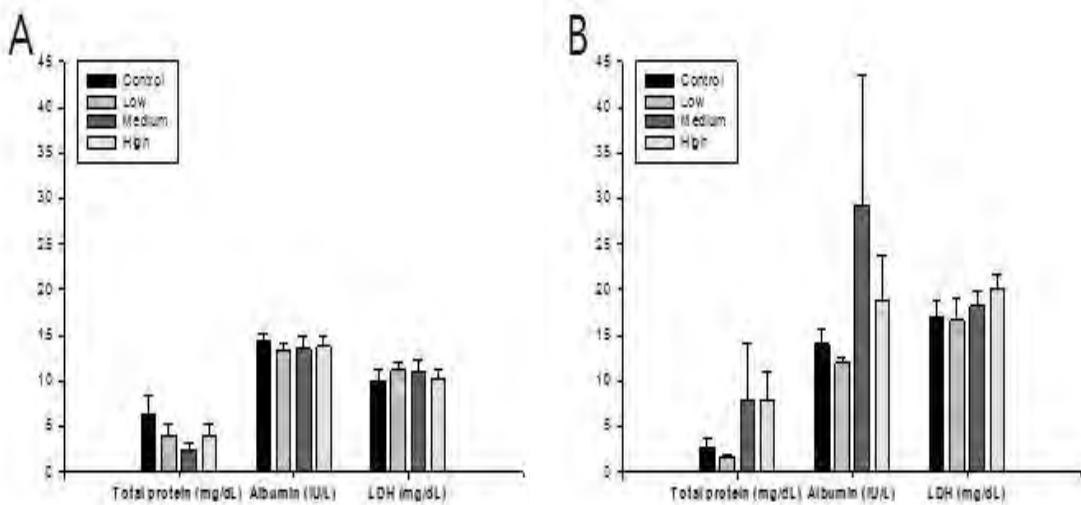


Figure 9-1. Inflammatory markers of BAL fluid in exposure group

A : male, B : female

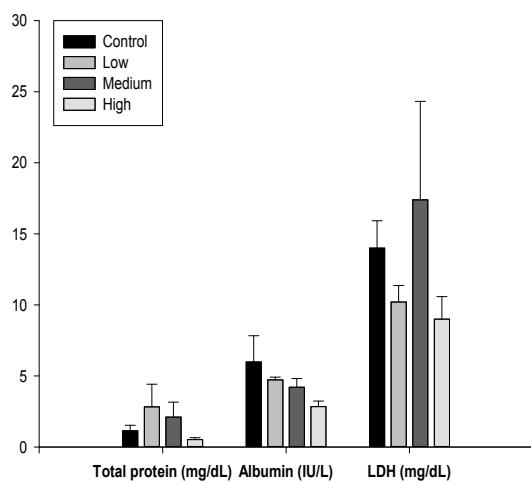


Figure 9-2. Inflammatory markers of BAL fluid in recovery group

9. APPENDICES

Appendix 1. Daily condition of exposure chamber

DAILY CONDITION OF EXPOSURE CHAMBER

STUDY ID : GT14-00042

No	DAY	Control						Low			
		Temp	Humi	O ₂	CO ₂	△.P.ch	Temp	Humi	O ₂	CO ₂	△.P.ch
1	02/11	21.13	46.30	20.02	358.75	-286.56	21.24	46.17	20.10	360.65	-280.06
2	02/12	21.55	47.88	20.02	365.95	-301.08	21.81	47.47	20.10	367.13	-280.66
3	02/13	21.97	46.72	20.04	346.02	-289.38	21.65	48.13	20.10	358.89	-290.38
4	02/14	21.37	45.21	19.99	344.03	-275.42	21.75	47.22	20.10	354.24	-299.47
5	02/17	21.92	49.02	20.02	342.81	-302.78	21.76	48.13	20.10	358.43	-286.33
6	02/18	22.29	46.87	20.05	341.35	-274.05	22.10	46.98	20.10	343.13	-290.81
7	02/19	22.05	49.93	20.01	341.38	-273.29	21.85	48.87	20.10	345.27	-287.50
8	02/20	22.06	45.89	20.04	340.28	-272.88	22.02	45.03	20.10	353.81	-284.16
9	02/21	22.03	46.99	20.05	343.51	-278.39	22.05	46.89	20.10	347.21	-283.23
10	02/24	22.14	46.40	20.03	352.92	-277.64	21.33	45.85	20.10	363.54	-289.97
11	02/25	21.72	46.61	20.06	352.26	-298.09	21.72	44.84	20.10	349.08	-298.08
12	02/26	22.96	45.39	20.07	352.15	-278.15	21.98	45.43	20.10	356.09	-288.59
13	02/27	22.82	45.25	20.11	346.74	-318.02	21.99	45.40	20.10	353.29	-275.56
14	02/28	22.75	44.86	20.08	343.28	-274.32	22.24	44.98	20.12	360.42	-288.23
15	03/03	22.06	44.44	20.04	341.94	-301.42	21.78	44.01	20.10	364.68	-275.01
No	DAY	Medium						High			
		Temp	Humi	O ₂	CO ₂	△.P.ch	Temp	Humi	O ₂	CO ₂	△.P.ch
1	02/11	21.54	46.22	20.04	366.70	-291.52	22.00	56.07	20.08	372.11	-286.91
2	02/12	21.78	52.61	20.06	369.72	-285.72	22.34	57.97	20.12	367.17	-287.10
3	02/13	21.64	50.88	20.08	353.09	-279.97	22.48	55.46	20.11	361.04	-281.91
4	02/14	22.06	49.63	20.08	366.30	-290.83	22.59	51.81	20.10	371.27	-288.05
5	02/17	21.98	50.82	20.09	364.19	-284.76	22.75	54.42	20.13	372.94	-279.23
6	02/18	22.43	51.17	20.12	359.29	-290.23	22.99	55.49	20.16	371.31	-296.32
7	02/19	22.10	52.67	20.09	353.94	-286.14	22.80	53.31	20.12	362.18	-282.07
8	02/20	22.51	49.71	20.11	366.23	-296.25	22.84	53.22	20.15	372.64	-285.14
9	02/21	22.11	53.64	20.08	361.87	-298.54	22.59	55.70	20.13	369.86	-280.44
10	02/24	22.20	54.22	20.06	363.10	-281.34	22.36	52.75	20.09	358.40	-282.96
11	02/25	22.44	51.04	20.07	368.50	-305.65	22.21	52.89	20.13	349.65	-297.64
12	02/26	22.42	50.44	20.09	362.58	-290.04	22.81	52.15	20.15	369.89	-287.15
13	02/27	22.42	49.17	20.10	351.39	-297.58	23.00	53.78	20.15	355.30	-303.61
14	02/28	22.72	47.62	20.11	363.43	-290.91	22.93	52.09	20.16	367.08	-290.80
15	03/03	22.12	49.49	20.09	369.62	-279.89	22.46	50.62	20.11	339.70	-298.79

Appendix 1. Daily condition of exposure chamber (continued)

DAILY CONDITION OF EXPOSURE CHAMBER

STUDY ID : GT14-00042

No	DAY	Control					Low				
		Temp	Humi	O ₂	CO ₂	△.P.ch	Temp	Humi	O ₂	CO ₂	△.P.ch
16	03/04	22.66	47.64	20.04	344.06	-297.53	22.16	47.16	20.12	371.77	-290.01
17	03/05	21.98	46.99	20.01	341.67	-288.12	21.72	47.76	20.10	358.51	-277.97
18	03/06	22.40	42.15	20.05	40.60	-276.40	21.49	43.81	20.10	370.43	-287.90
19	03/07	21.86	35.70	20.07	40.60	-309.46	21.53	41.83	20.10	373.55	-291.75
20	03/10	21.34	44.91	20.04	353.01	-294.45	21.48	43.29	20.09	350.69	-284.45
21	03/11	22.55	44.35	20.07	40.60	-280.58	22.45	40.66	20.10	370.01	-293.10
22	03/12	22.07	45.05	20.04	346.98	-290.90	21.89	43.80	20.11	349.23	-290.91
23	03/13	22.22	45.50	20.05	345.06	-282.07	22.28	45.04	20.11	347.81	-282.65
24	03/14	22.32	45.14	20.06	343.26	-284.68	22.00	39.79	20.12	380.58	-297.21
25	03/17	22.45	47.56	20.08	344.71	-287.34	22.69	51.90	20.13	353.51	-286.70
26	03/18	22.84	44.66	20.09	342.32	-283.73	23.03	44.60	20.12	354.81	-290.68
27	03/19	22.64	45.23	20.06	343.13	-292.69	22.75	41.37	20.13	369.36	-279.82
28	03/20	22.77	44.28	20.06	341.95	-296.27	22.52	37.80	20.13	362.54	-285.05
29	03/21	22.99	43.07	20.08	342.05	-298.41	22.50	35.85	20.11	377.10	-301.57
No	DAY	Medium					High				
		Temp	Humi	O ₂	CO ₂	△.P.ch	Temp	Humi	O ₂	CO ₂	△.P.ch
16	03/04	22.48	51.09	20.09	371.51	-277.19	22.74	51.14	20.15	344.73	-280.22
17	03/05	21.80	53.01	20.06	362.62	-280.41	22.61	51.80	20.12	366.09	-296.82
18	03/06	21.72	49.37	20.08	367.04	-281.52	22.49	50.19	20.12	336.98	-286.64
19	03/07	21.80	47.97	20.10	368.75	-292.54	22.33	53.16	20.14	335.86	-262.57
20	03/10	21.62	49.53	20.06	367.11	-284.47	22.52	51.49	20.11	356.38	-300.35
21	03/11	22.79	48.62	20.15	373.15	-295.11	22.69	52.02	20.18	348.15	-301.36
22	03/12	22.50	46.26	20.09	361.14	-288.68	22.86	52.43	20.12	363.32	-300.30
23	03/13	22.63	48.42	20.10	370.21	-283.63	23.19	52.50	20.15	366.84	-297.23
24	03/14	22.52	46.84	20.12	379.99	-287.36	23.17	51.37	20.14	338.76	-281.62
25	03/17	22.80	58.47	20.11	372.01	-296.58	23.13	65.02	20.14	340.40	-281.91
26	03/18	22.75	55.44	20.13	375.78	-269.65	23.30	56.81	20.17	340.70	-280.09
27	03/19	22.73	52.82	20.11	372.14	-275.60	23.35	52.52	20.18	341.60	-270.26
28	03/20	22.54	47.85	20.13	373.58	-284.46	23.28	46.61	20.19	336.75	-282.81
29	03/21	22.71	46.34	20.13	366.63	-321.63	23.39	46.17	20.17	350.08	-287.68

Appendix 1. Daily condition of exposure chamber (continued)

DAILY CONDITION OF EXPOSURE CHAMBER

STUDY ID : GT14-00042

No	DAY	Control						Low			
		Temp	Humi	O ₂	CO ₂	△.P.ch	Temp	Humi	O ₂	CO ₂	△.P.ch
30	03/24	22.34	41.91	20.05	355.09	-288.00	22.14	43.10	20.10	376.07	-289.30
31	03/25	22.66	51.38	20.08	347.37	-293.37	22.75	53.37	20.12	369.20	-277.72
32	03/26	22.88	49.70	20.07	345.58	-288.32	22.39	49.53	20.11	361.87	-280.44
33	03/27	23.20	44.26	20.10	341.63	-295.30	23.02	42.79	20.14	378.75	-274.97
34	03/28	23.20	53.31	20.05	347.71	-281.58	22.59	49.36	20.14	377.54	-306.78
35	03/31	23.93	42.42	20.14	351.79	-309.41	23.60	43.27	20.16	379.19	-305.29
36	04/01	23.83	47.02	20.15	353.78	-305.71	23.36	45.13	20.15	379.83	-305.33
37	04/02	23.98	45.81	20.14	344.26	-276.75	23.61	46.16	20.16	377.91	-273.43
38	04/03	24.07	46.93	20.10	341.44	-286.97	23.26	47.39	20.11	372.13	-296.79
39	04/04	23.19	42.44	20.08	341.18	-302.29	22.72	41.83	20.13	375.40	-292.55
40	04/07	23.12	44.83	20.09	342.54	-288.43	22.43	43.74	20.12	382.73	-295.85
41	04/08	23.45	45.20	20.12	354.68	-299.51	22.75	46.17	20.13	382.57	-292.45
42	04/09	22.70	49.74	20.10	349.20	-291.83	22.08	46.15	20.12	378.04	-308.56
43	04/10	23.51	47.78	20.02	342.74	-290.22	22.84	45.61	20.09	374.67	-298.75
No	DAY	Medium						High			
		Temp	Humi	O ₂	CO ₂	△.P.ch	Temp	Humi	O ₂	CO ₂	△.P.ch
30	03/24	22.44	50.34	20.10	375.86	-284.50	23.12	50.95	20.15	340.80	-290.49
31	03/25	22.77	60.20	20.13	374.58	-288.15	23.33	64.17	20.18	337.28	-286.06
32	03/26	22.48	56.13	20.11	379.24	-285.95	23.32	59.11	20.15	338.55	-275.68
33	03/27	23.10	47.90	20.17	377.44	-289.40	23.60	51.89	20.22	337.85	-275.52
34	03/28	22.94	56.69	20.12	379.62	-300.96	23.41	60.53	20.16	346.72	-300.90
35	03/31	23.57	46.94	20.16	375.38	-294.08	23.87	51.56	20.21	341.44	-293.14
36	04/01	23.49	44.13	20.20	385.66	-307.53	23.70	48.00	20.22	347.20	-286.79
37	04/02	23.64	44.68	20.20	375.84	-280.18	23.61	47.56	20.24	341.31	-267.30
38	04/03	23.29	56.01	20.16	379.71	-305.19	23.31	57.07	20.17	337.89	-283.48
39	04/04	23.06	47.17	20.14	378.94	-304.71	23.17	52.66	20.19	337.82	-286.55
40	04/07	23.02	51.48	20.15	382.23	-299.08	22.91	56.19	20.17	338.62	-295.37
41	04/08	23.18	53.30	20.14	383.78	-314.83	23.24	55.72	20.22	342.94	-292.24
42	04/09	22.36	53.25	20.12	381.90	-306.01	22.70	59.24	20.18	342.17	-286.06
43	04/10	22.91	51.52	20.02	378.10	-301.00	23.12	60.71	20.07	339.96	-286.83

Appendix 1. Daily condition of exposure chamber (continued)

DAILY CONDITION OF EXPOSURE CHAMBER

STUDY ID : GT14-00042

No	DAY	Control					Low				
		Temp	Humi	O ₂	CO ₂	△.P.ch	Temp	Humi	O ₂	CO ₂	△.P.ch
44	04/11	23.38	49.23	20.08	348.88	-307.06	22.70	50.61	20.15	378.24	-300.63
45	04/14	23.05	48.73	20.09	347.80	-297.50	22.16	49.33	20.13	386.77	-291.77
46	04/15	23.07	48.86	20.09	346.53	-296.93	22.26	49.94	20.13	382.69	-315.37
47	04/16	23.15	49.55	20.09	353.00	-291.10	22.53	51.32	20.15	367.72	-325.36
48	04/17	23.86	46.20	20.14	353.52	-298.17	23.42	47.04	20.16	390.54	-286.67
49	04/18	23.23	48.31	20.09	352.85	-294.67	22.47	49.83	20.14	384.96	-291.01
50	04/21	23.33	48.27	20.12	346.99	-289.90	22.70	50.99	20.15	386.30	-305.67
51	04/22	23.22	46.96	20.13	344.92	-324.65	22.88	45.77	20.13	379.88	-295.26
52	04/23	24.12	47.72	20.17	347.96	-284.02	23.92	48.22	20.17	375.52	-300.31
53	04/24	23.75	49.49	20.13	352.62	-282.21	22.99	50.04	20.14	384.15	-305.52
54	04/25	23.88	46.85	20.16	347.89	-299.96	23.42	46.33	20.15	379.00	-293.13
55	04/28	23.25	49.12	20.10	341.08	-300.66	22.39	51.03	20.11	370.74	-298.83
56	04/29	23.28	50.95	20.11	343.01	-293.85	23.07	50.35	20.15	364.25	-302.32
57	04/30	23.05	50.83	20.14	345.83	-299.58	22.81	47.76	20.14	346.70	-305.90
No	DAY	Medium					High				
		Temp	Humi	O ₂	CO ₂	△.P.ch	Temp	Humi	O ₂	CO ₂	△.P.ch
44	04/11	22.79	57.26	20.11	380.09	-299.21	22.92	62.39	20.16	344.35	-297.90
45	04/14	22.41	56.54	20.11	380.35	-298.68	22.41	60.99	20.14	344.78	-293.13
46	04/15	22.31	56.37	20.13	379.05	-304.22	22.52	60.95	20.19	344.01	-301.28
47	04/16	22.49	57.66	20.11	370.47	-306.02	22.91	61.68	20.13	337.27	-301.74
48	04/17	23.44	51.76	20.15	385.39	-310.18	23.52	57.93	20.22	352.46	-296.70
49	04/18	22.49	57.14	20.08	384.35	-303.32	22.58	62.13	20.15	344.48	-299.39
50	04/21	22.45	59.19	20.10	380.99	-293.34	22.64	62.52	20.15	338.10	-292.42
51	04/22	22.45	53.05	20.14	377.45	-291.05	22.72	59.74	20.19	340.67	-287.47
52	04/23	23.83	57.45	20.18	378.00	-305.01	23.78	59.77	20.18	345.48	-318.18
53	04/24	22.75	58.44	20.15	383.29	-304.00	23.23	63.32	20.16	349.86	-290.46
54	04/25	23.21	52.27	20.19	378.70	-307.53	23.40	58.26	20.21	350.92	-299.72
55	04/28	22.43	61.01	20.12	371.07	-285.40	22.92	65.03	20.13	340.59	-297.19
56	04/29	22.71	55.66	20.13	366.85	-309.17	22.71	63.99	20.16	341.49	-292.23
57	04/30	22.66	55.16	20.13	356.33	-290.85	23.03	62.28	20.15	336.95	-282.27

Appendix 1. Daily condition of exposure chamber (continued)

DAILY CONDITION OF EXPOSURE CHAMBER

STUDY ID : GT14-00042

No	DAY	Control					Low				
		Temp	Humi	O ₂	CO ₂	△.P.ch	Temp	Humi	O ₂	CO ₂	△.P.ch
58	05/01	23.66	48.86	20.14	340.72	-284.24	22.97	49.85	20.16	377.15	-304.42
59	05/02	23.92	47.83	20.13	350.51	-282.68	23.00	49.36	20.15	387.84	-285.41
60	05/05	23.34	45.90	20.16	340.72	-291.61	22.88	40.98	20.14	377.54	-326.32
61	05/06	23.43	45.34	20.15	340.75	-314.80	23.49	46.63	20.16	378.31	-299.59
62	05/07	23.89	44.74	20.16	342.23	-289.37	23.74	39.11	20.16	373.90	-293.17
63	05/08	22.48	51.10	20.11	341.40	-299.72	22.06	49.27	20.12	363.33	-297.95
64	05/09	22.35	44.77	20.12	343.76	-299.96	21.70	49.20	20.10	379.46	-328.28
65	05/12	22.30	54.85	20.10	344.29	-299.10	22.04	48.92	20.11	382.44	-290.13
66	05/13	21.38	53.89	20.07	343.71	-280.62	20.95	49.07	20.10	363.97	-288.69
67	05/14	21.07	53.05	20.07	341.72	-277.02	21.03	47.30	20.10	364.18	-278.68
68	05/15	21.48	52.59	20.06	40.60	-274.69	20.92	50.78	20.10	346.18	-285.77
No	DAY	Medium					High				
		Temp	Humi	O ₂	CO ₂	△.P.ch	Temp	Humi	O ₂	CO ₂	△.P.ch
58	05/01	22.72	55.05	20.12	366.45	-293.09	22.90	61.84	20.16	340.24	-279.51
59	05/02	22.96	56.97	20.14	378.56	-282.77	22.98	61.06	20.16	346.30	-287.42
60	05/05	23.03	48.75	20.19	372.88	-295.96	23.52	51.48	20.21	341.39	-286.98
61	05/06	23.51	44.66	20.22	365.36	-305.52	23.52	52.32	20.24	341.63	-314.84
62	05/07	23.35	45.83	20.18	382.73	-294.82	23.84	52.42	20.23	347.23	-282.31
63	05/08	21.69	57.29	20.10	364.65	-290.75	22.56	62.98	20.13	341.70	-284.07
64	05/09	21.26	55.30	20.11	371.90	-307.70	22.38	60.35	20.17	347.82	-309.48
65	05/12	21.57	55.87	20.10	367.90	-301.54	22.43	61.14	20.16	342.82	-305.19
66	05/13	20.69	57.92	20.08	368.98	-284.72	20.98	62.64	20.11	336.77	-282.17
67	05/14	20.72	58.27	20.08	374.07	-278.23	20.99	61.37	20.10	380.44	-281.80
68	05/15	20.80	56.76	20.08	353.37	-325.24	21.15	59.80	20.15	353.55	-302.49

Appendix 2. Daily concentration of MWCNT

DAILY CONCENTRATION OF MWCNT				
STUDY ID : GT14-00042			UNIT : mg/m ³	
DAY	Group			
	Control	Low	Medium	High
02/11	0.000	0.173	0.506	0.988
02/11	0.000	0.174	0.506	0.994
02/12	0.000	0.163	0.510	1.031
02/12	0.000	0.168	0.504	1.148
02/13	0.000	0.164	0.508	1.205
02/13	0.000	0.166	0.504	0.852
02/14	0.000	0.165	0.505	1.038
02/14	0.000	0.167	0.507	0.858
02/17	0.000	0.166	0.505	1.200
02/17	0.000	0.167	0.506	0.856
02/18	0.000	0.166	0.511	1.213
02/18	0.000	0.170	0.507	1.030
02/19	0.000	0.165	0.508	1.030
02/19	0.000	0.171	0.504	1.015
02/20	0.000	0.164	0.507	0.864
02/20	0.000	0.167	0.510	1.173
02/21	0.000	0.168	0.516	1.040
02/21	0.000	0.169	0.504	1.031
02/24	0.000	0.170	0.506	1.157
02/24	0.000	0.171	0.508	0.863
02/25	0.000	0.172	0.506	1.010
02/25	0.000	0.169	0.502	1.020
02/26	0.000	0.170	0.506	1.006
02/26	0.000	0.170	0.506	0.856
02/27	0.000	0.169	0.506	1.010
02/27	0.000	0.170	0.509	1.031
02/28	0.000	0.169	0.503	0.860
02/28	0.000	0.170	0.509	1.028
03/03	0.000	0.169	0.504	0.856
03/03	0.000	0.171	0.503	1.014
03/04	0.000	0.169	0.505	1.002
03/04	0.000	0.167	0.502	1.014
03/05	0.000	0.169	0.501	1.163
03/05	0.000	0.165	0.509	1.037

Appendix 2. Daily concentration of MWCNT (continued)

DAILY CONCENTRATION OF MWCNT				
STUDY ID : GT14-00042		UNIT : mg/m ³		
DAY		Group		
		Control	Low	Medium
03/06	0.000	0.170	0.501	0.858
03/06	0.000	0.165	0.508	1.038
03/07	0.000	0.169	0.503	1.017
03/07	0.000	0.163	0.507	1.030
03/10	0.000	0.172	0.503	1.023
03/10	0.000	0.169	0.504	0.859
03/11	0.000	0.166	0.502	0.858
03/11	0.000	0.169	0.504	1.016
03/12	0.000	0.166	0.507	1.024
03/12	0.000	0.167	0.507	1.017
03/13	0.000	0.170	0.509	1.009
03/13	0.000	0.168	0.504	0.859
03/14	0.000	0.170	0.507	1.008
03/14	0.000	0.171	0.500	1.021
03/17	0.000	0.168	0.502	1.018
03/17	0.000	0.164	0.506	1.199
03/18	0.000	0.165	0.502	1.027
03/18	0.000	0.170	0.501	1.014
03/19	0.000	0.170	0.506	1.026
03/19	0.000	0.171	0.500	1.006
03/20	0.000	0.166	0.506	1.213
03/20	0.000	0.172	0.507	1.027
03/21	0.000	0.170	0.509	1.030
03/21	0.000	0.171	0.505	1.024
03/24	0.000	0.172	0.504	1.037
03/24	0.000	0.170	0.501	0.850
03/25	0.000	0.170	0.501	1.040
03/25	0.000	0.170	0.504	1.017
03/26	0.000	0.170	0.507	0.859
03/26	0.000	0.166	0.504	1.019
03/27	0.000	0.172	0.506	1.001
03/27	0.000	0.170	0.503	1.020
03/28	0.000	0.170	0.502	1.020
03/28	0.000	0.172	0.506	1.021
03/31	0.000	0.170	0.506	1.020
03/31	0.000	0.171	0.504	1.154

Appendix 2. Daily concentration of MWCNT (continued)

DAILY CONCENTRATION OF MWCNT				
STUDY ID : GT14-00042		UNIT : mg/m ³		
DAY		Group		
		Control	Low	Medium
04/01	0.000	0.170	0.506	1.028
04/01	0.000	0.171	0.503	1.016
04/02	0.000	0.170	0.501	1.004
04/02	0.000	0.170	0.505	0.847
04/03	0.000	0.172	0.506	1.006
04/03	0.000	0.170	0.506	1.028
04/04	0.000	0.170	0.508	1.003
04/04	0.000	0.169	0.508	1.009
04/07	0.000	0.170	0.504	1.152
04/07	0.000	0.171	0.506	1.009
04/08	0.000	0.170	0.500	1.017
04/08	0.000	0.171	0.507	1.011
04/09	0.000	0.170	0.509	1.009
04/09	0.000	0.170	0.509	1.008
04/10	0.000	0.172	0.507	1.006
04/10	0.000	0.170	0.500	1.021
04/11	0.000	0.170	0.509	1.013
04/11	0.000	0.170	0.503	1.004
04/14	0.000	0.170	0.507	1.007
04/14	0.000	0.170	0.509	1.170
04/15	0.000	0.170	0.503	1.012
04/15	0.000	0.170	0.503	0.851
04/16	0.000	0.172	0.506	1.003
04/16	0.000	0.171	0.506	1.007
04/17	0.000	0.170	0.507	1.001
04/17	0.000	0.171	0.507	1.004
04/18	0.000	0.170	0.502	1.159
04/18	0.000	0.170	0.502	1.001
04/21	0.000	0.172	0.507	1.005
04/21	0.000	0.167	0.505	1.004
04/22	0.000	0.170	0.501	1.002
04/22	0.000	0.171	0.503	1.012
04/23	0.000	0.170	0.503	0.835
04/23	0.000	0.170	0.501	1.171
04/24	0.000	0.170	0.500	1.007
04/24	0.000	0.172	0.505	1.012

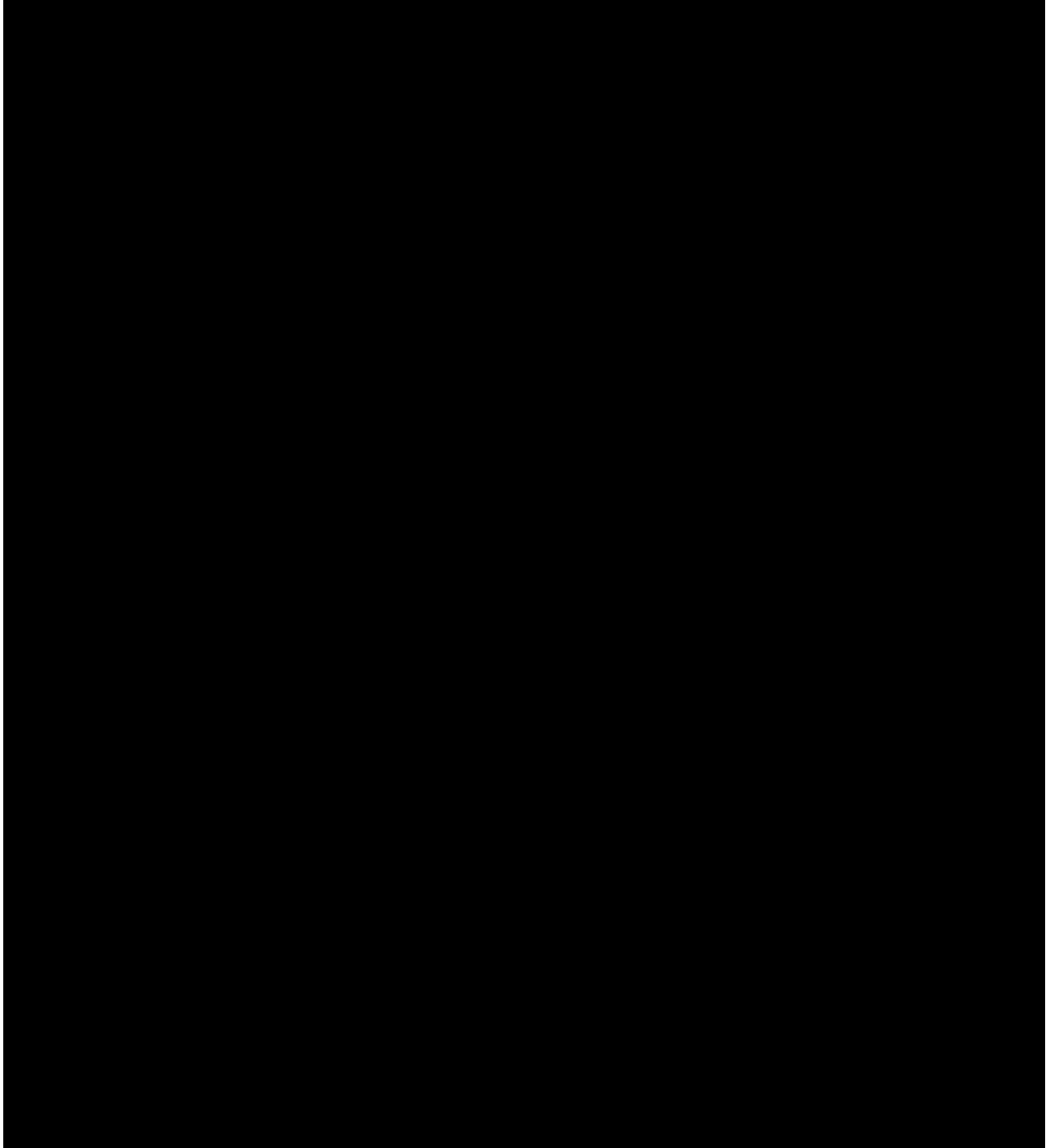
Appendix 2. Daily concentration of MWCNT (continued)

DAILY CONCENTRATION OF MWCNT				
			UNIT : mg/m ³	
DAY	Group			
	Control	Low	Medium	High
04/25	0.000	0.170	0.505	1.012
04/25	0.000	0.170	0.504	1.020
04/28	0.000	0.171	0.496	1.044
04/28	0.000	0.172	0.500	0.837
04/29	0.000	0.170	0.503	0.853
04/29	0.000	0.170	0.506	1.007
04/30	0.000	0.170	0.506	0.836
04/30	0.000	0.172	0.492	1.021
05/01	0.000	0.172	0.508	1.004
05/01	0.000	0.172	0.509	1.171
05/02	0.000	0.170	0.500	1.180
05/02	0.000	0.167	0.506	1.006
05/05	0.000	0.170	0.502	1.009
05/05	0.000	0.171	0.506	1.004
05/06	0.000	0.170	0.506	0.840
05/06	0.000	0.172	0.502	1.021
05/07	0.000	0.170	0.500	1.176
05/07	0.000	0.170	0.507	1.006
05/08	0.000	0.171	0.509	0.850
05/08	0.000	0.170	0.504	0.843
05/09	0.000	0.173	0.504	0.986
05/09	0.000	0.171	0.506	1.175
05/12	0.000	0.173	0.509	1.006
05/12	0.000	0.172	0.510	1.002
05/13	0.000	0.173	0.507	0.995
05/13	0.000	0.173	0.505	0.147
05/14	0.000	0.173	0.520	0.992
05/14	0.000	0.172	0.509	0.838
05/15	0.000	0.174	0.512	0.993
05/15	0.000	0.174	0.504	0.983

Appendix 3. Daily distribution of particle in vehicle

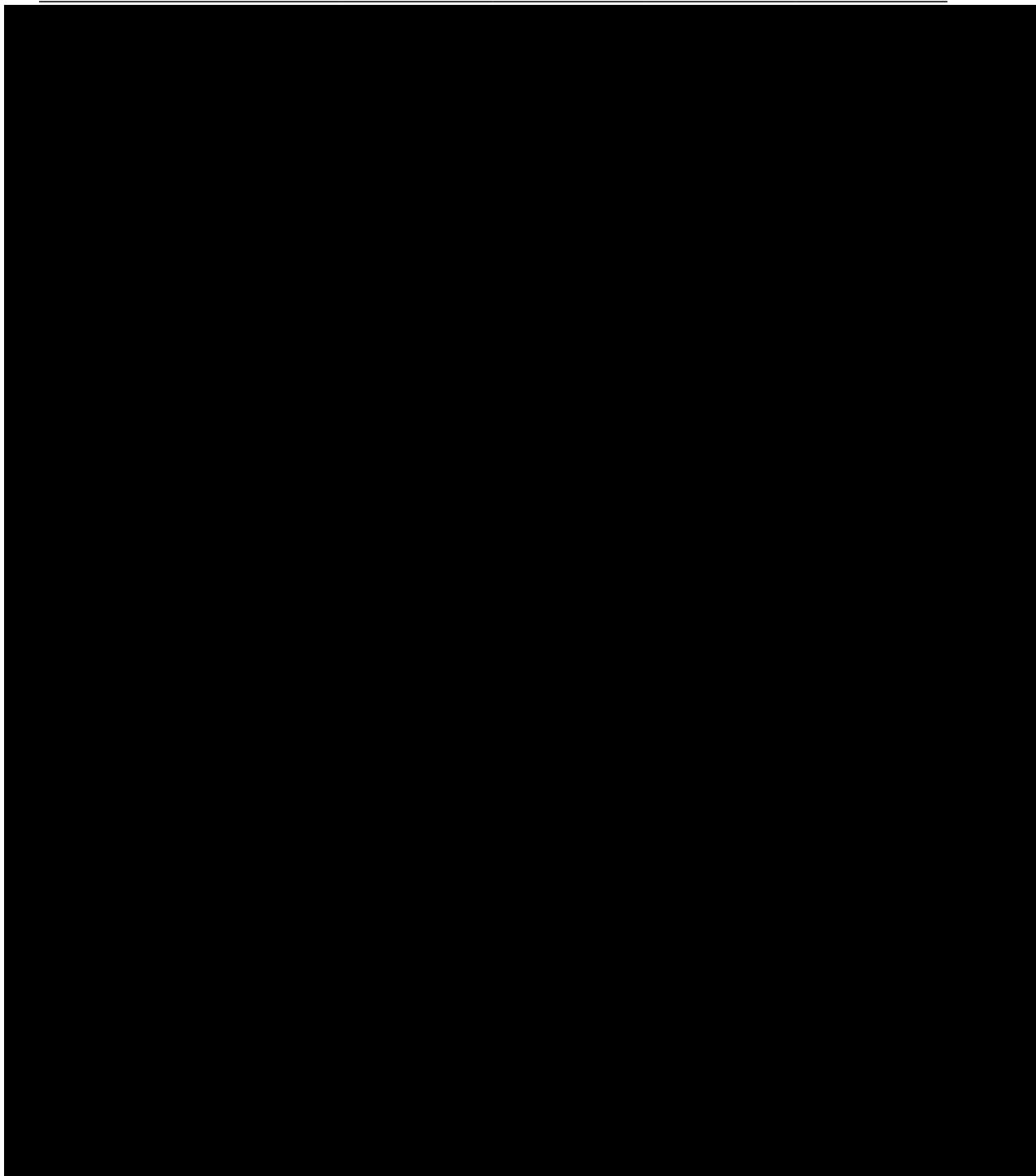
DAILY DISTRIBUTION OF PARTICLE IN VEHICLE

STUDY ID : GT14-00042



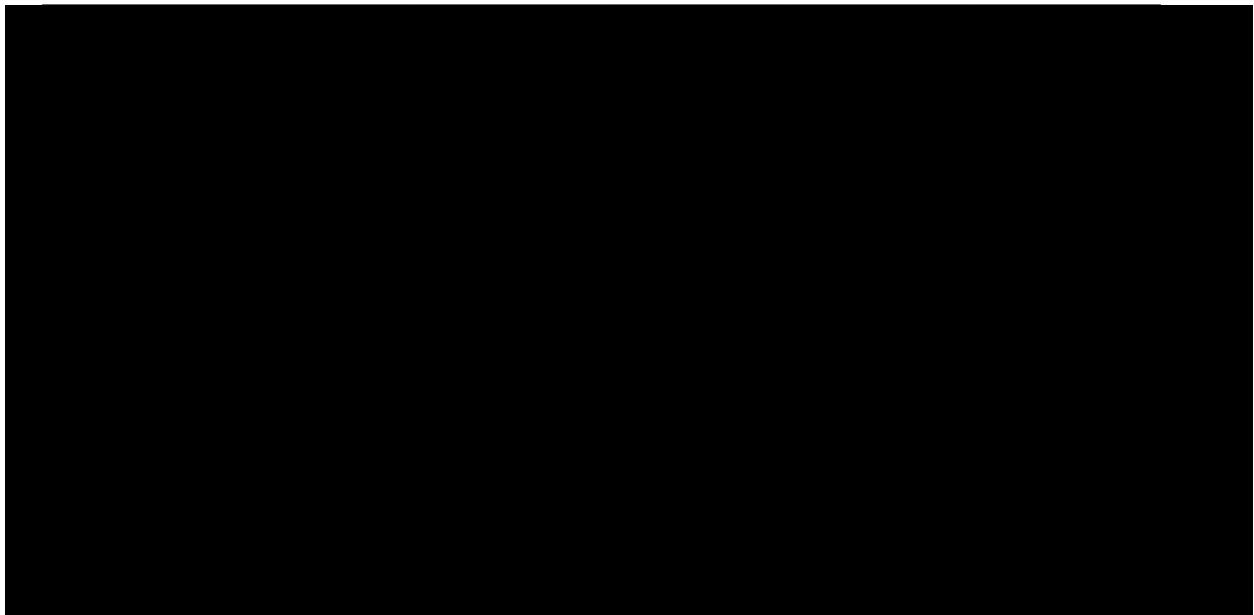
Appendix 3. Daily distribution of particle in vehicle (continued)

DAILY DISTRIBUTION OF PARTICLE IN VEHICLE



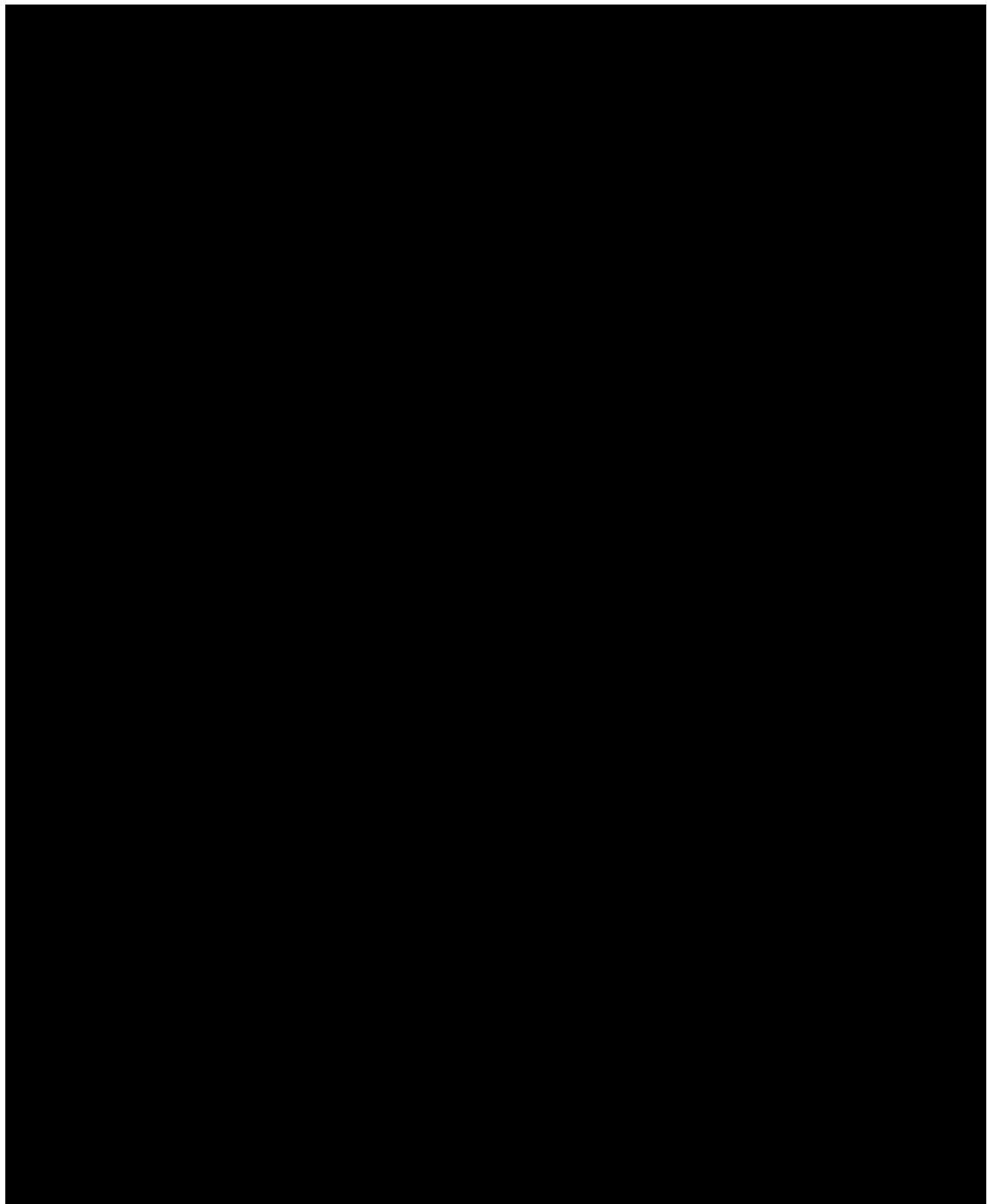
Appendix 3. Daily distribution of particle in vehicle (continued)

DAILY DISTRIBUTION OF PARTICLE IN VEHICLE



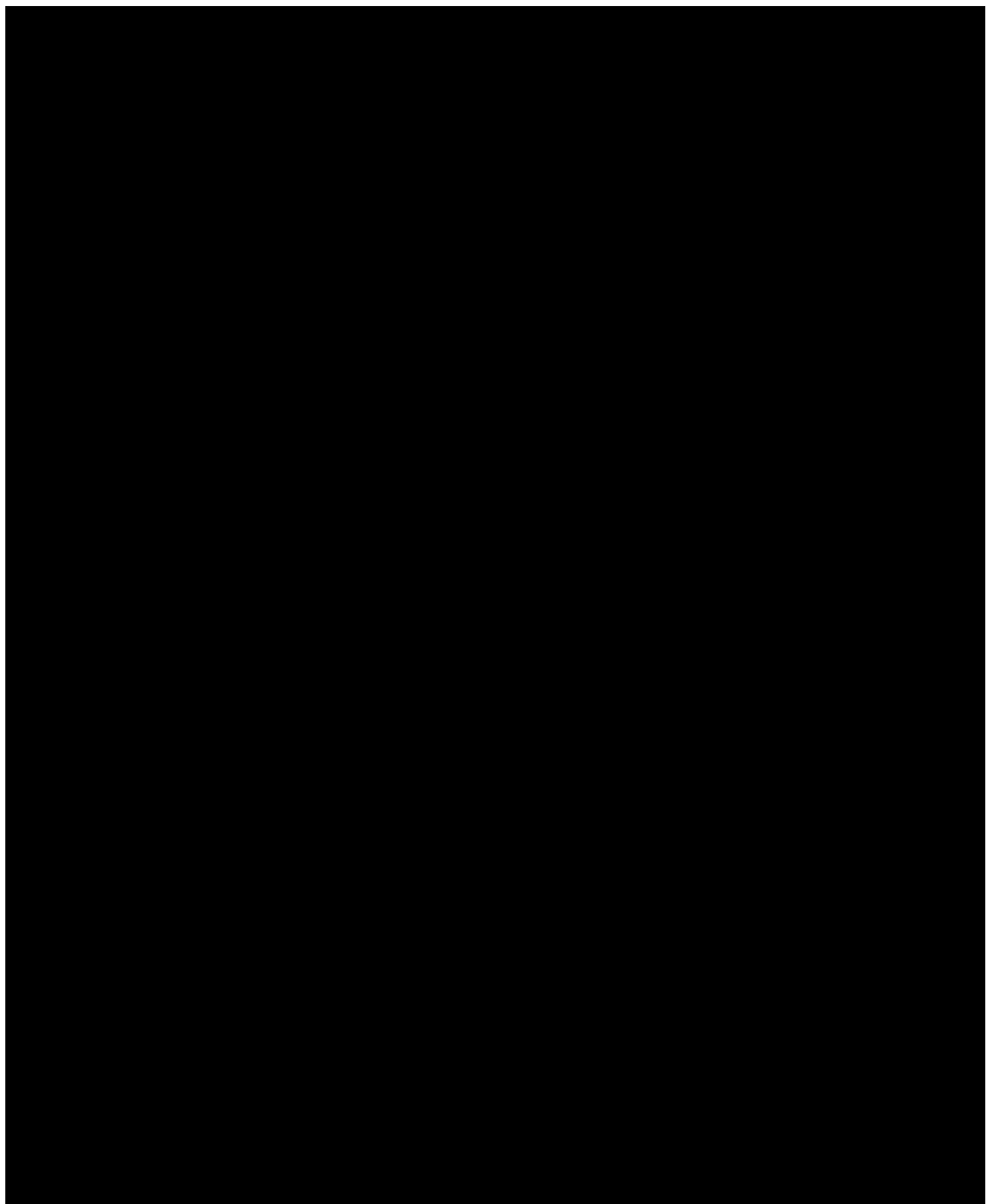
Appendix 4. The length of MWCNT by TEM

THE LENGTH OF MWCNT BY TEM



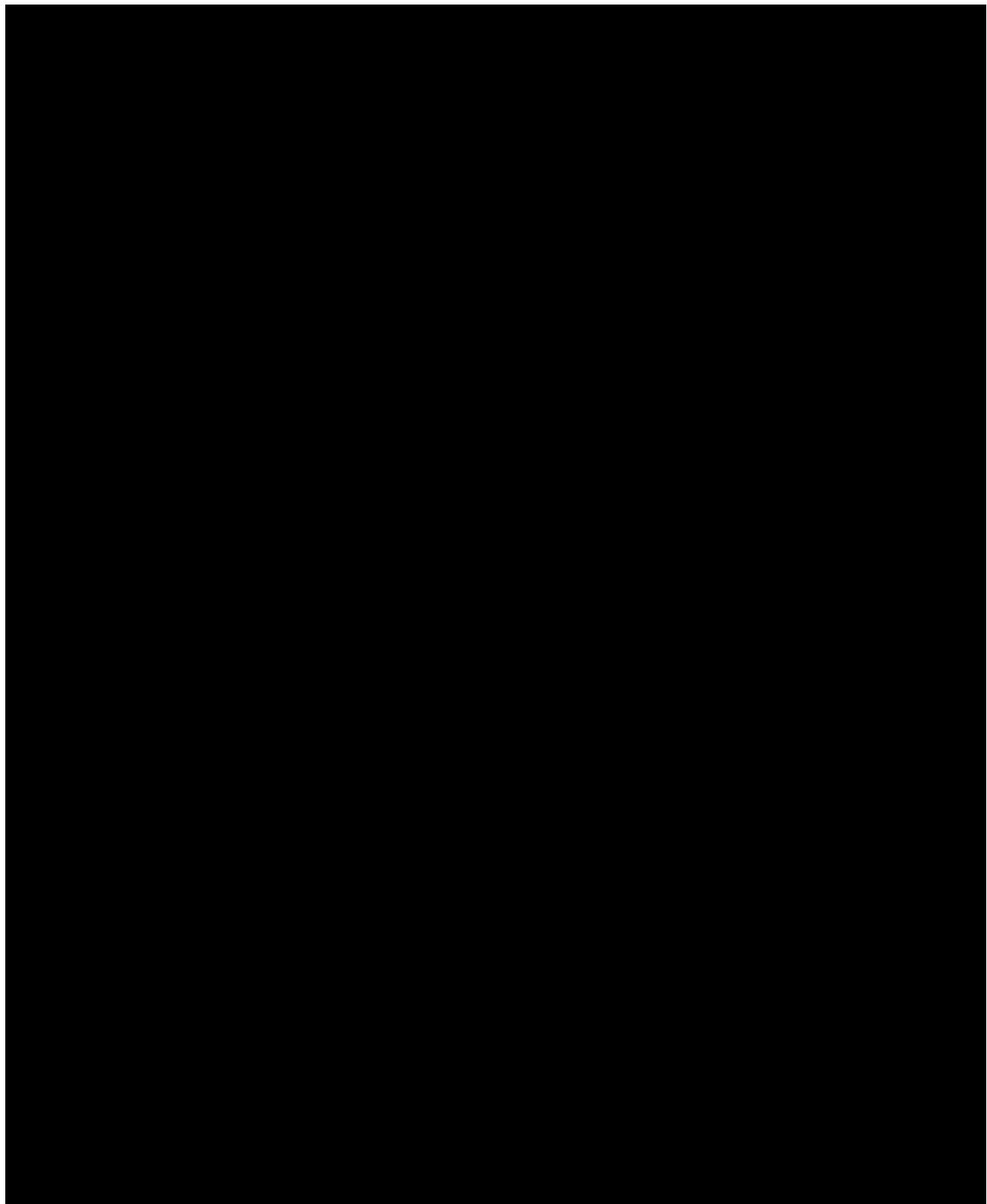
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



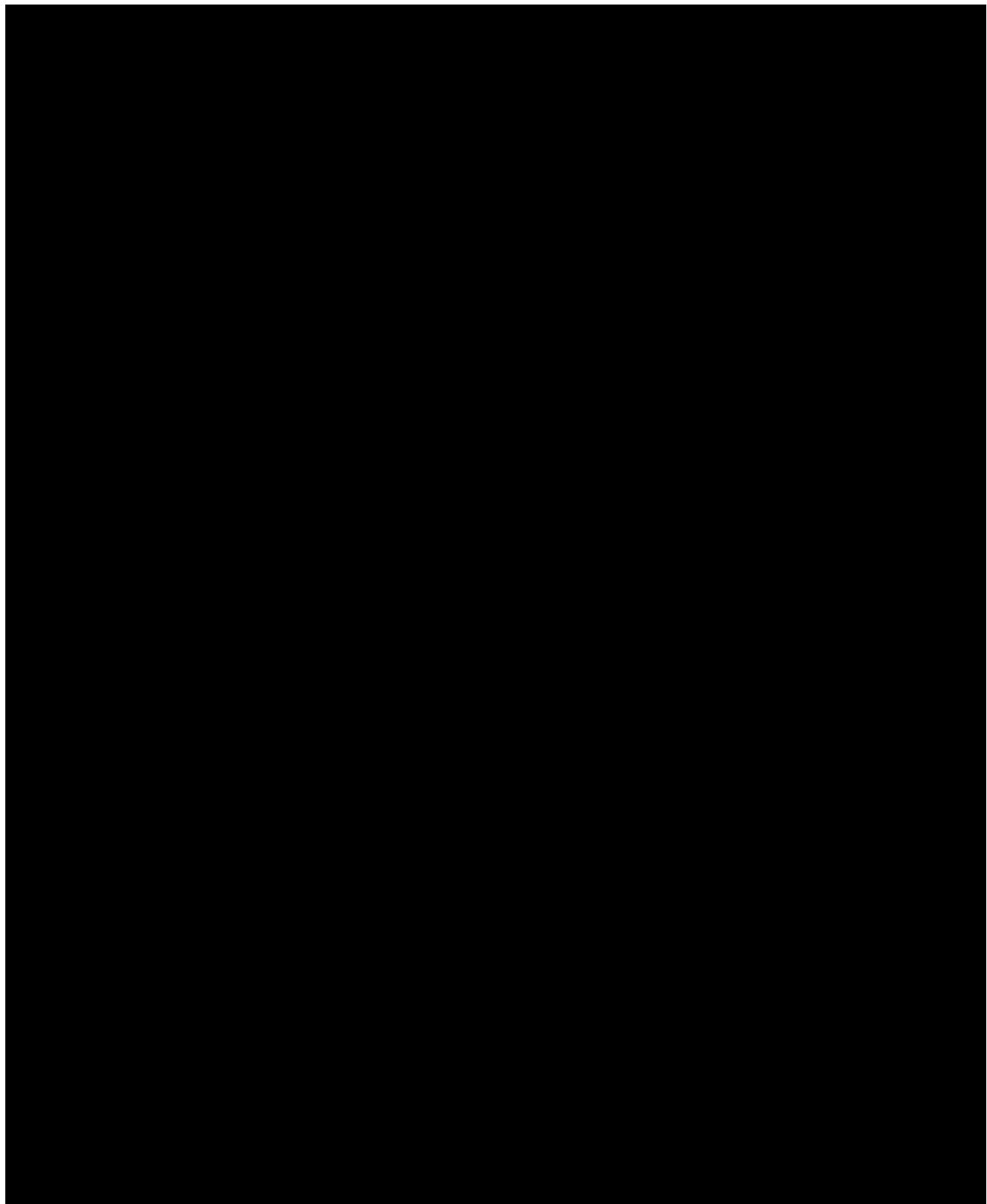
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



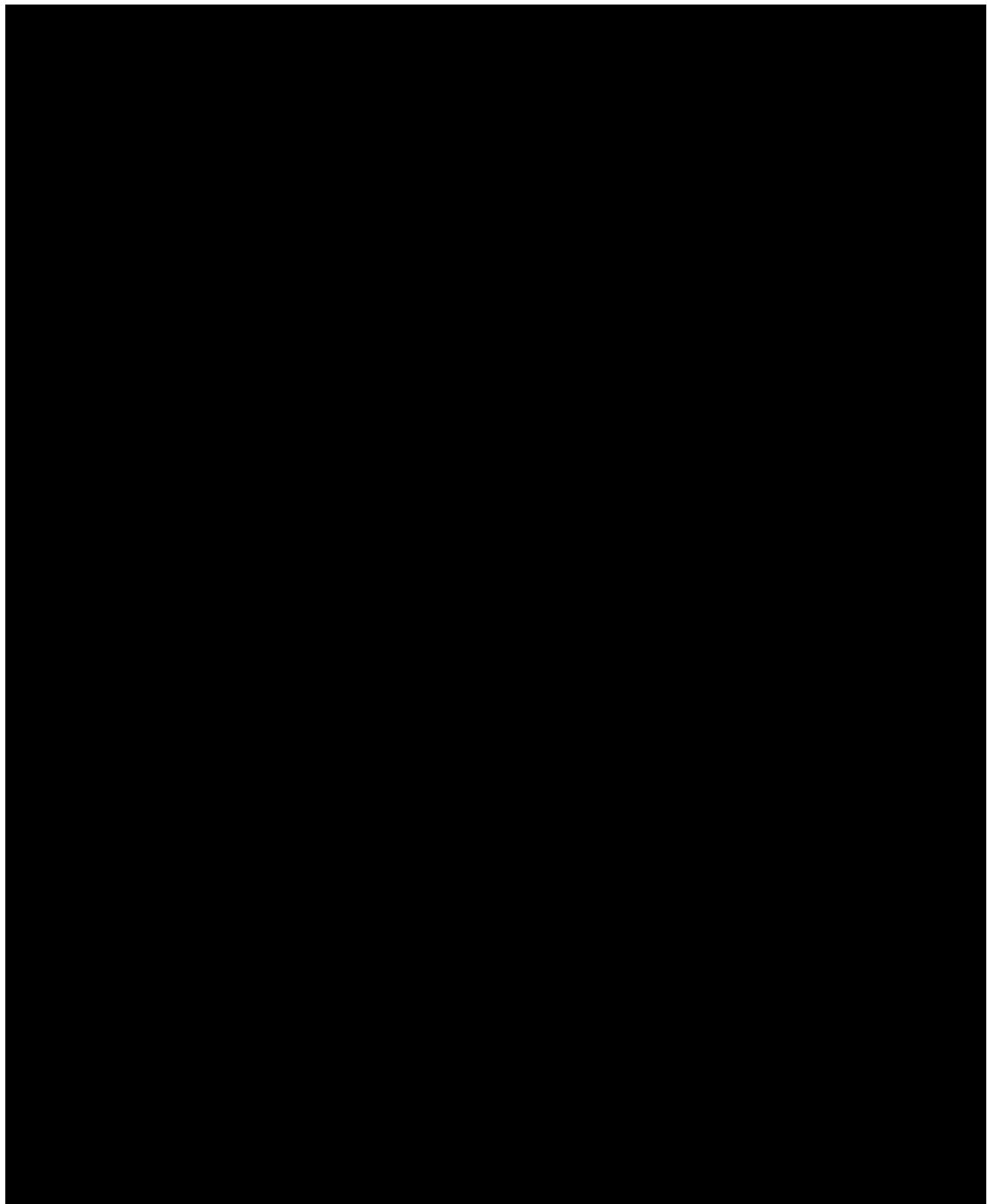
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



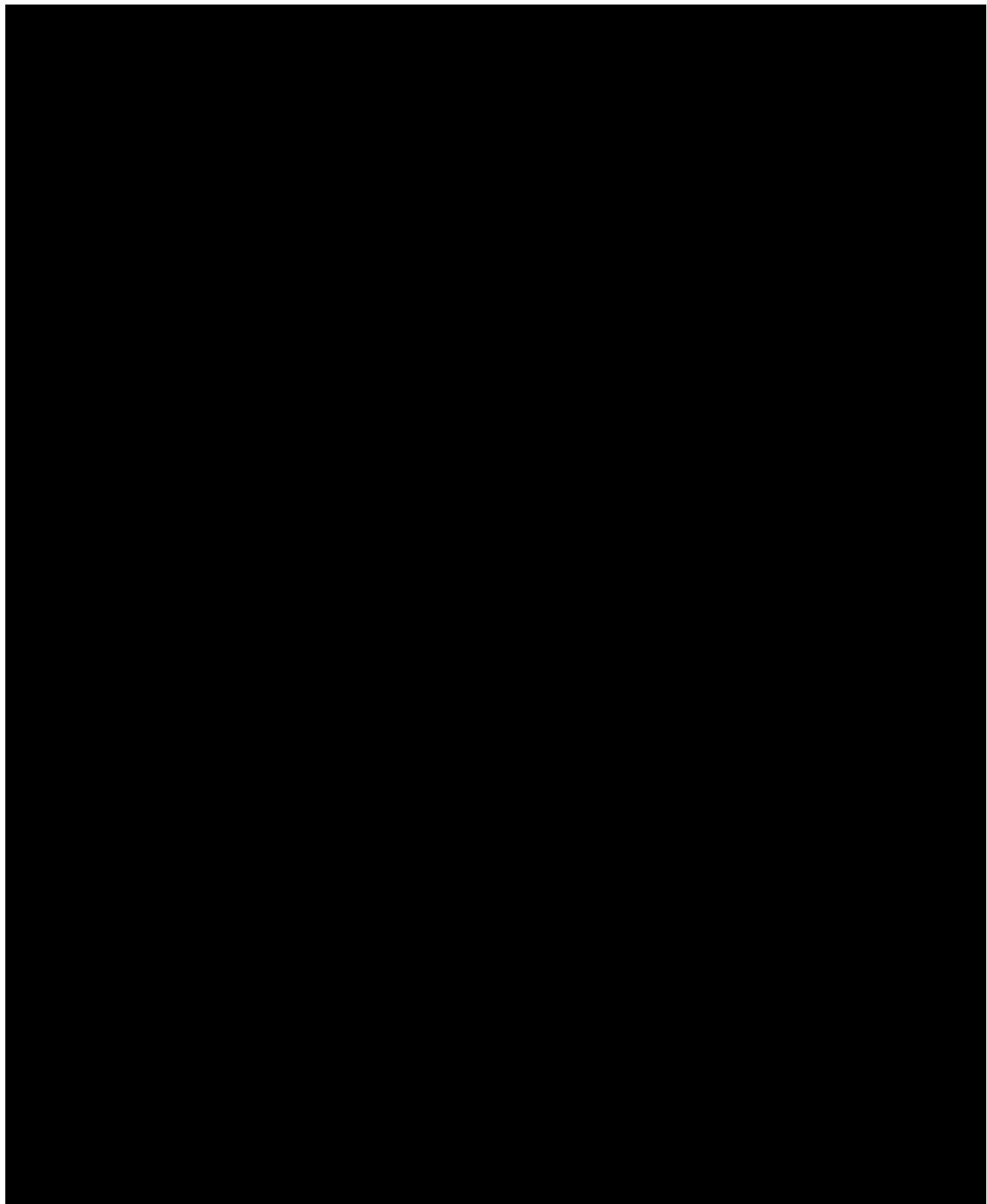
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



Appendix 4. The length of MWCNT by TEM (continued)

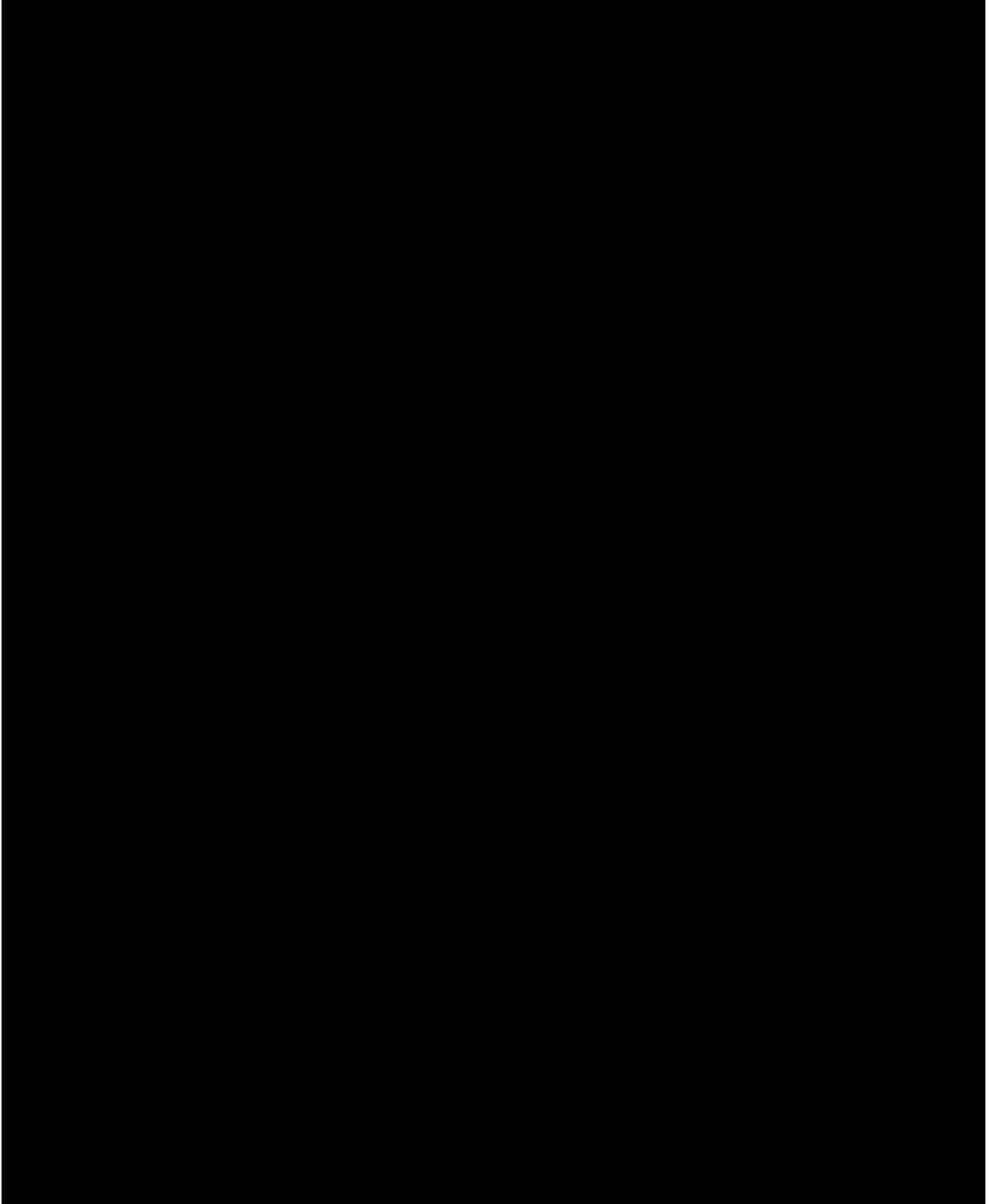
THE LENGTH OF MWCNT BY TEM



Appendix 4. The length of MWCNT by TEM (continued)

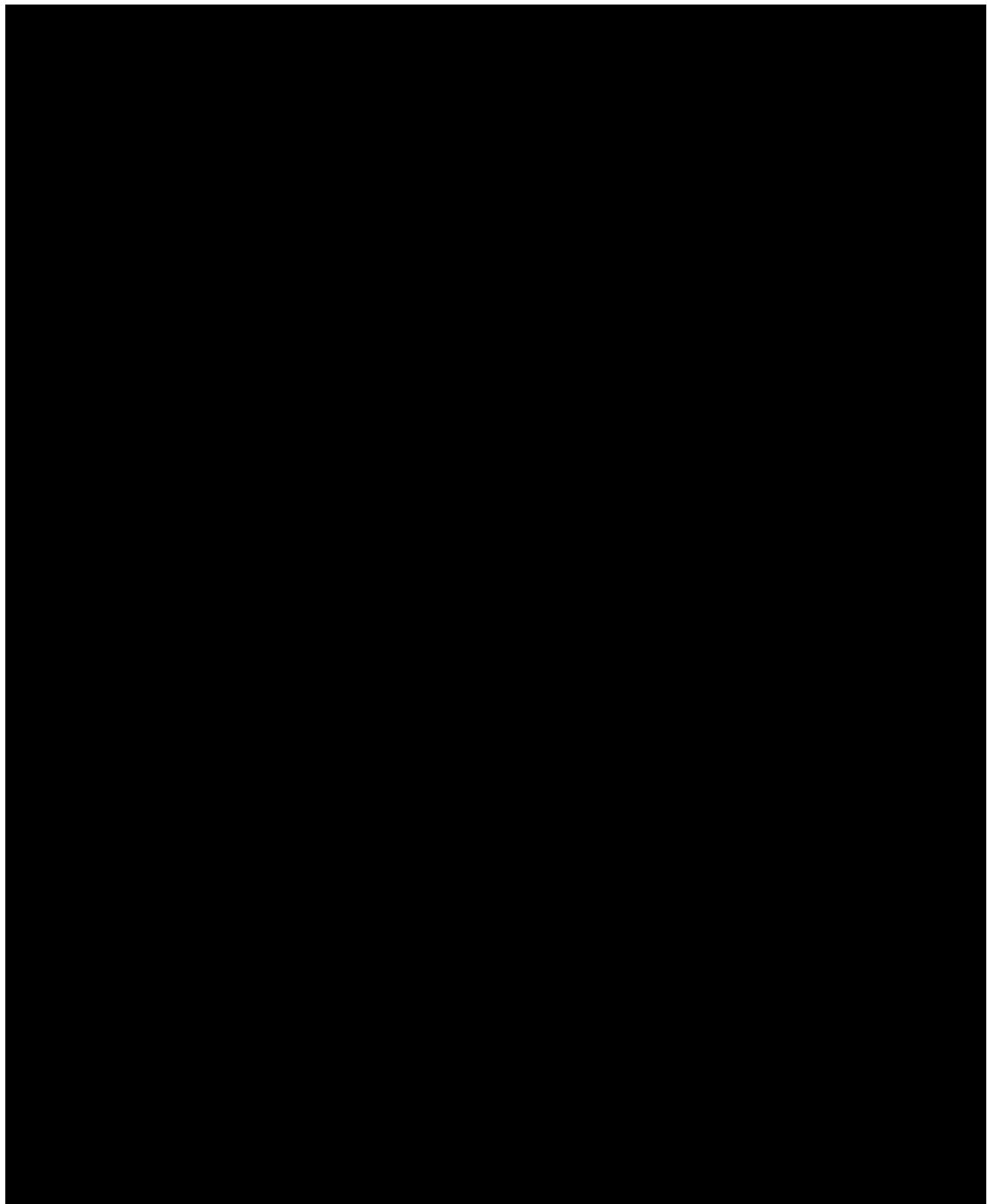
THE LENGTH OF MWCNT BY TEM

STUDY ID : GT14-00042



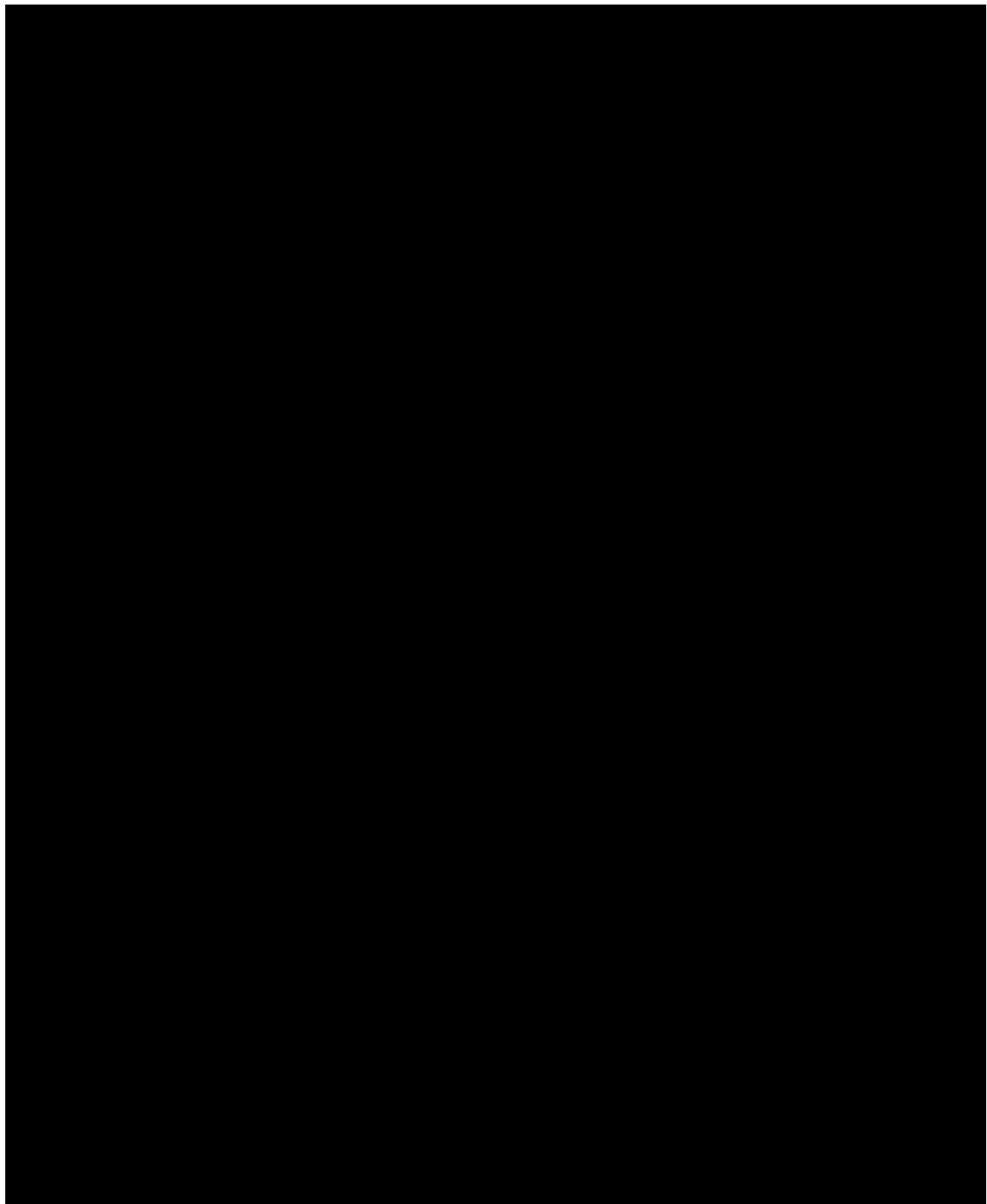
Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



Appendix 4. The length of MWCNT by TEM (continued)

THE LENGTH OF MWCNT BY TEM



Appendix 5-1. Individual clinical signs of male rats in exposure group

CLINICAL SIGNS INDIVIDUAL DATA		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042		SEX : MALE
Animal No.	OBSERVATIONS	TIME OCCURED
CE-1	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
CE-2	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
CE-3	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
CE-4	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
CE-5	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
CE-6	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
CE-7	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
CE-8	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
CE-9	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
CE-10	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
CR-1	Normal	0 - 92 Day
CR-2	Normal	0 - 92 Day
CR-3	Normal	0 - 92 Day
CR-4	Normal	0 - 92 Day
CR-5	Normal	0 - 92 Day

Appendix 5-1. Individual clinical signs of male rats in exposure group (continued)

CLINICAL SIGNS INDIVIDUAL DATA		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042		SEX : MALE
Animal No.	OBSERVATIONS	TIME OCCURED
LE-11	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
LE-12	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
LE-13	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
LE-14	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
LE-15	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LE-16	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LE-17	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LE-18	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LE-19	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LE-20	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LR-6	Normal	0 - 92 Day
LR-7	Normal	0 - 92 Day
LR-8	Normal	0 - 92 Day
LR-9	Normal	0 - 92 Day
LR-10	Normal	0 - 92 Day

Appendix 5-1. Individual clinical signs of male rats in exposure group (continued)

CLINICAL SIGNS INDIVIDUAL DATA		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042		SEX : MALE
Animal No.	OBSERVATIONS	TIME OCCURED
ME-21	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
ME-22	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
ME-23	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
ME-24	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
ME-25	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
ME-26	Normal	0 - 79 Day
	Restlessness, Convulsion, Stupor	80 Day
	Death	81 Day
ME-27	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
ME-28	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
ME-29	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
ME-30	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
MR-11	Normal	0 - 93 Day
MR-12	Normal	0 - 92 Day
MR-13	Normal	0 - 92 Day
MR-14	Normal	0 - 92 Day
MR-15	Normal	0 - 92 Day

Appendix 5-1. Individual clinical signs of male rats in exposure group (continued)

CLINICAL SIGNS INDIVIDUAL DATA		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042		SEX : MALE
Animal No.	OBSERVATIONS	TIME OCCURED
HE-31	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
HE-32	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
HE-33	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
HE-34	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
HE-35	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HE-36	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HE-37	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HE-38	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HE-39	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HE-40	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HR-16	Normal	0 - 92 Day
HR-17	Normal	0 - 92 Day
HR-18	Normal	0 - 92 Day
HR-19	Normal	0 - 92 Day
HR-20	Normal	0 - 92 Day

Appendix 5-2. Individual clinical signs of female rats in exposure group

CLINICAL SIGNS INDIVIDUAL DATA		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042		SEX : FEMALE
Animal No.	OBSERVATIONS	TIME OCCURED
CE-41	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
CE-42	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
CE-43	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
CE-44	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
CE-45	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
CE-46	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
CE-47	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
CE-48	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
CE-49	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
CE-50	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LE-51	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
LE-52	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
LE-53	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
LE-54	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
LE-55	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LE-56	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LE-57	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LE-58	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LE-59	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
LE-60	Normal	0 - 92 Day
	Terminal sacrifice	92 Day

Appendix 5-2. Individual clinical signs of female rats in exposure group (continued)

CLINICAL SIGNS INDIVIDUAL DATA		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042		SEX : FEMALE
Animal No.	OBSERVATIONS	TIME OCCURED
ME-61	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
ME-62	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
ME-63	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
ME-64	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
ME-65	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
ME-66	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
ME-67	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
ME-68	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
ME-69	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
ME-70	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HE-71	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
HE-72	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
HE-73	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
HE-74	Normal	0 - 93 Day
	Terminal sacrifice	93 Day
HE-75	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HE-76	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HE-77	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HE-78	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HE-79	Normal	0 - 92 Day
	Terminal sacrifice	92 Day
HE-80	Normal	0 - 92 Day
	Terminal sacrifice	92 Day

Appendix 5-3. Individual clinical signs of male rats in recovery group

CLINICAL SIGNS INDIVIDUAL DATA		
RECOVERY 13WEEKS		
STUDY ID : GT14-00042		SEX : MALE
Animal No.	OBSERVATIONS	TIME OCCURED
CR-1	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
CR-2	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
CR-3	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
CR-4	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
CR-5	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
LR-6	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
LR-7	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
LR-8	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
LR-9	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
LR-10	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
MR-11	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
MR-12	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
MR-13	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
MR-14	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
MR-15	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
HR-16	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
HR-17	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
HR-18	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
HR-19	Normal	0 - 183 Day
	Terminal sacrifice	183 Day
HR-20	Normal	0 - 183 Day
	Terminal sacrifice	183 Day

Appendix 6-1. Individual body weights of male rats in exposure group

INDIVIDUAL BODY WEIGHTS (Grams)								
EXPOSURE 13WEEKS								
STUDY ID : GT14-00042		GROUP : Control				SEX : MALE		
		DOSE : 0 mg/m ³						
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
CE-1	132.39	144.87	162.77	181.94	205.21	219.48	236.95	239.86
CE-2	136.50	152.19	174.70	185.21	204.85	222.55	235.43	247.90
CE-3	142.80	154.52	184.02	210.05	228.10	245.49	262.14	274.99
CE-4	145.23	156.58	181.39	197.94	209.39	219.24	235.76	251.97
CE-5	145.27	160.89	187.58	208.73	223.90	238.45	253.18	265.61
CE-6	147.16	160.60	189.53	207.68	223.51	239.94	248.10	260.80
CE-7	151.37	159.60	186.91	200.10	214.31	237.50	250.70	257.13
CE-8	153.28	163.18	183.01	204.75	220.46	235.79	247.93	254.43
CE-9	153.48	166.55	192.27	210.22	225.16	236.58	247.66	252.00
CE-10	156.08	165.91	194.95	210.96	225.48	233.92	240.35	250.76
N	10	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice	
CE-1	247.21	253.21	260.41	266.74	273.62	281.08	256.53	
CE-2	261.83	279.08	289.61	287.91	291.74	298.25	278.47	
CE-3	286.21	299.07	310.55	312.04	318.07	321.32	300.93	
CE-4	261.90	270.42	281.79	286.38	294.20	298.11	278.76	
CE-5	277.47	287.09	295.05	301.21	311.97	315.74	293.27	
CE-6	271.27	277.44	287.44	290.99	298.25	302.34	281.04	
CE-7	269.14	282.60	290.89	289.42	291.51	297.70	280.59	
CE-8	267.69	273.60	286.88	287.95	286.49	288.36	269.73	
CE-9	259.65	273.69	281.67	290.97	265.50	281.08	265.50	
CE-10	265.73	271.22	281.73	277.74	278.81	282.87	263.93	
N	10	10	10	10	10	10	10	

Appendix 6-1. Individual body weights of male rats in exposure group (continued)

INDIVIDUAL BODY WEIGHTS (Grams)								
EXPOSURE 13WEEKS								
STUDY ID : GT14-00042	GROUP : Low				SEX : MALE			
	DOSE : 0.2 mg/m ³							
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
LE-11	133.12	151.06	176.09	195.38	209.21	219.16	233.02	239.66
LE-12	136.08	142.38	170.49	193.75	207.84	221.76	239.85	244.31
LE-13	142.87	157.11	182.09	203.76	221.66	240.19	253.02	261.73
LE-14	145.20	162.13	185.42	199.91	213.28	217.39	234.52	246.11
LE-15	145.29	160.96	190.12	214.68	233.35	251.52	271.35	282.20
LE-16	146.45	159.06	184.07	207.82	221.46	227.34	238.05	244.86
LE-17	151.38	162.80	188.74	208.48	223.02	229.97	251.06	250.68
LE-18	152.57	165.64	195.77	214.59	228.88	250.48	267.66	263.38
LE-19	154.83	168.05	196.92	213.82	231.89	249.94	267.35	274.91
LE-20	156.06	170.47	198.99	216.18	232.58	239.04	252.80	255.69
N	10	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice	
LE-11	249.15	259.98	267.08	268.76	275.95	277.20	258.20	
LE-12	262.40	272.13	280.22	273.63	277.17	283.25	264.83	
LE-13	273.24	283.17	298.36	309.31	319.34	323.71	301.99	
LE-14	260.91	269.43	275.69	278.40	284.02	293.58	272.46	
LE-15	287.31	296.71	307.37	311.31	318.94	327.47	304.26	
LE-16	257.47	265.53	272.04	278.01	283.68	285.71	268.42	
LE-17	265.92	269.63	279.20	284.35	292.71	295.53	271.61	
LE-18	277.86	283.82	290.04	300.24	307.93	313.54	292.28	
LE-19	280.86	287.33	299.02	299.67	309.38	315.41	296.26	
LE-20	262.72	278.15	290.49	288.39	297.36	304.68	287.01	
N	10	10	10	10	10	10	10	

Appendix 6-1. Individual body weights of male rats in exposure group (continued)

INDIVIDUAL BODY WEIGHTS (Grams)								
EXPOSURE 13WEEKS								
STUDY ID : GT14-00042	GROUP : Medium				SEX : MALE			
	DOSE : 0.5 mg/m ³							
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
ME-21	134.26	143.33	167.49	185.87	199.41	212.88	229.39	240.56
ME-22	135.62	152.73	182.15	198.25	217.33	232.27	246.87	254.69
ME-23	143.33	155.15	176.98	198.17	214.59	226.52	237.00	239.61
ME-24	144.66	160.03	190.91	209.53	223.31	236.48	246.56	255.43
ME-25	145.40	158.13	181.77	186.05	201.46	219.05	234.87	247.50
ME-26	146.09	163.42	193.89	211.55	229.30	244.76	265.14	280.87
ME-27	151.62	163.54	185.22	205.77	218.68	221.15	238.26	250.34
ME-28	152.32	167.49	196.41	216.54	232.95	249.64	263.52	261.78
ME-29	154.99	170.59	194.56	220.86	234.22	254.13	266.42	274.58
ME-30	155.89	167.40	198.02	215.67	230.94	243.36	258.74	271.82
N	10	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice	
ME-21	246.20	254.77	259.64	266.48	272.65	276.74	252.58	
ME-22	256.97	262.02	260.03	267.32	269.32	279.24	259.24	
ME-23	254.16	271.82	271.26	276.60	277.08	277.73	261.80	
ME-24	266.19	279.71	290.26	281.15	292.47	300.07	278.10	
ME-25	254.52	257.12	266.45	276.90	276.45	281.49	260.80	
ME-26	276.72	284.84	295.46	296.04	-	-	-	
ME-27	264.84	276.77	283.34	284.68	287.80	295.50	270.94	
ME-28	278.45	292.45	299.34	296.28	306.91	307.30	287.37	
ME-29	273.82	279.90	291.37	298.18	310.15	312.94	290.72	
ME-30	279.05	281.11	285.03	291.83	305.82	307.33	289.00	
N	10	10	10	10	9	9	9	

Appendix 6-1. Individual body weights of male rats in exposure group (continued)

INDIVIDUAL BODY WEIGHTS (Grams)								
EXPOSURE 13WEEKS								
STUDY ID : GT14-00042	GROUP : High				SEX : MALE			
	DOSE : 1.0 mg/m ³							
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
HE-31	134.51	145.31	162.71	176.64	191.17	199.61	216.16	228.77
HE-32	135.26	149.27	169.66	186.76	209.02	230.26	241.78	252.92
HE-33	144.28	157.74	183.46	202.21	220.20	233.89	247.29	254.37
HE-34	144.56	158.80	175.79	193.08	205.29	221.55	231.41	238.04
HE-35	145.58	160.94	188.73	212.63	227.32	247.60	261.59	270.32
HE-36	145.60	163.88	189.43	207.08	223.66	238.93	254.81	267.14
HE-37	152.03	166.08	190.84	213.99	222.75	242.83	254.40	267.82
HE-38	152.03	168.64	200.03	222.73	241.23	262.94	276.66	279.91
HE-39	155.28	166.98	193.65	209.97	228.68	241.73	256.79	265.14
HE-40	155.40	170.61	198.85	222.31	237.30	251.70	261.60	266.67
N	10	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice	
HE-31	242.98	249.68	255.91	260.53	263.30	266.97	242.38	
HE-32	267.93	279.37	293.28	290.45	295.99	305.15	283.40	
HE-33	256.79	261.70	270.24	280.41	284.54	287.33	267.04	
HE-34	244.20	252.33	257.11	263.09	271.44	274.65	254.58	
HE-35	281.12	288.10	295.83	301.75	307.26	310.97	289.29	
HE-36	283.00	296.58	307.23	310.22	317.05	318.18	300.74	
HE-37	283.18	291.11	300.77	303.41	311.03	313.41	294.95	
HE-38	288.19	297.17	307.45	313.28	313.65	315.73	299.00	
HE-39	277.32	286.24	294.40	296.43	302.46	305.26	282.27	
HE-40	272.43	282.40	287.60	288.20	293.14	299.39	277.35	
N	10	10	10	10	10	10	10	

Appendix 6-1. Individual body weights of male rats in exposure group (continued)

INDIVIDUAL BODY WEIGHTS (Grams)								
EXPOSURE 13WEEKS								
STUDY ID : GT14-00042		GROUP : Control DOSE : 0 mg/m³				SEX : MALE		
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
CR-1	136.66	148.01	172.35	192.42	213.38	233.05	250.37	254.32
CR-2	142.09	153.48	174.54	199.15	217.59	239.01	252.23	266.63
CR-3	147.65	161.88	190.74	212.06	232.27	243.86	253.44	265.52
CR-4	151.23	163.29	179.94	199.12	215.19	231.07	247.59	254.35
CR-5	157.84	176.03	206.55	224.78	238.14	256.55	273.52	274.10
N	5	5	5	5	5	5	5	5
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week		
CR-1	260.83	267.04	280.75	284.62	293.78	302.36		
CR-2	282.07	293.37	303.88	310.14	316.87	315.44		
CR-3	282.59	294.49	302.29	306.43	307.13	307.80		
CR-4	270.75	277.61	286.53	290.63	298.52	302.24		
CR-5	282.96	298.75	307.06	304.61	308.20	317.59		
N	5	5	5	5	5	5		
STUDY ID : GT14-00042		GROUP : Low DOSE : 0.2 mg/m³				SEX : MALE		
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
LR-6	137.35	155.45	184.53	207.16	226.51	246.80	262.83	271.79
LR-7	141.46	151.01	182.44	203.82	225.61	241.19	249.20	258.82
LR-8	147.85	160.70	188.67	212.84	230.83	249.63	263.82	278.39
LR-9	150.58	157.93	177.11	195.36	214.56	225.15	241.58	248.01
LR-10	158.53	165.16	187.37	200.78	213.42	229.18	235.91	246.10
N	5	5	5	5	5	5	5	5
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week		
LR-6	282.65	291.92	301.76	303.41	300.72	301.98		
LR-7	271.10	276.79	288.08	292.35	300.56	302.30		
LR-8	287.44	298.27	309.14	315.19	323.34	328.60		
LR-9	264.50	276.85	286.11	292.54	298.29	307.25		
LR-10	264.28	274.00	278.57	284.62	286.95	298.31		
N	5	5	5	5	5	5		

Appendix 6-1. Individual body weights of male rats in exposure group (continued)

INDIVIDUAL BODY WEIGHTS (Grams)								
EXPOSURE 13WEEKS								
STUDY ID : GT14-00042		GROUP : Medium				SEX : MALE		
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
MR-11	138.11	152.09	181.73	199.65	212.26	231.69	249.11	258.36
MR-12	140.76	149.32	175.46	189.29	204.53	217.70	231.61	225.47
MR-13	148.03	162.17	190.88	208.00	228.35	242.44	255.44	268.04
MR-14	150.29	160.63	190.70	215.43	239.19	260.28	272.80	287.12
MR-15	158.60	167.81	193.76	207.08	206.94	225.53	238.47	247.91
N	5	5	5	5	5	5	5	5
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week		
MR-11	273.13	281.29	292.99	283.44	284.13	289.46		
MR-12	238.16	242.58	252.97	258.50	265.13	266.24		
MR-13	275.72	277.03	281.26	285.82	295.32	302.02		
MR-14	291.98	300.36	312.91	320.60	330.94	329.54		
MR-15	258.27	266.26	272.18	279.39	280.21	280.58		
N	5	5	5	5	5	5		
STUDY ID : GT14-00042		GROUP : High				SEX : MALE		
		DOSE : 1.0 mg/m ³						
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
HR-16	139.94	150.64	170.38	192.49	205.08	222.47	234.39	244.60
HR-17	140.04	149.56	179.55	197.73	215.19	233.72	242.00	253.22
HR-18	148.47	159.76	182.87	191.51	206.47	223.19	237.85	243.97
HR-19	148.79	160.92	183.75	199.23	215.59	231.73	246.12	251.60
HR-20	158.72	170.43	203.25	215.56	236.23	254.36	268.52	282.48
N	5	5	5	5	5	5	5	5
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week		
HR-16	256.11	262.69	274.29	279.84	285.79	290.15		
HR-17	267.94	277.56	290.80	288.14	298.27	302.55		
HR-18	248.79	258.62	269.94	281.69	294.10	299.66		
HR-19	263.00	266.73	272.89	277.64	287.30	287.61		
HR-20	288.55	296.44	308.08	310.12	316.83	319.03		
N	5	5	5	5	5	5		

Appendix 6-2. Individual body weights of female rats in exposure group

INDIVIDUAL BODY WEIGHTS (Grams)								
EXPOSURE 13WEEKS								
STUDY ID : GT14-00042	GROUP : Control				SEX : FEMALE			
	DOSE : 0 mg/m ³							
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
CE-41	123.07	129.03	134.80	138.26	142.10	148.03	151.95	153.85
CE-42	132.24	136.78	144.68	151.96	156.76	161.28	157.28	163.97
CE-43	132.26	137.86	148.67	151.13	154.69	160.95	160.39	166.86
CE-44	135.79	139.55	143.34	145.50	148.61	151.11	148.06	154.55
CE-45	135.86	142.16	152.60	158.57	157.25	166.57	168.80	169.83
CE-46	138.09	141.39	143.68	148.33	151.23	155.52	156.03	160.84
CE-47	138.46	140.30	143.83	146.25	149.54	155.42	155.95	158.12
CE-48	140.36	142.99	148.64	153.60	156.52	157.96	155.91	159.88
CE-49	140.45	141.47	149.30	150.39	149.14	148.20	147.61	148.04
CE-50	145.50	140.02	149.98	155.51	156.52	158.97	161.19	162.79
N	10	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice	
CE-41	158.84	160.87	167.30	167.33	169.16	169.99	152.83	
CE-42	163.86	169.45	168.77	167.34	170.58	165.60	150.95	
CE-43	168.29	176.49	182.19	177.91	177.15	178.36	165.15	
CE-44	153.79	154.65	155.93	152.17	159.19	160.50	144.58	
CE-45	173.06	179.00	181.72	181.66	185.45	186.79	170.05	
CE-46	163.90	164.72	168.47	169.55	170.68	169.73	154.21	
CE-47	162.58	168.74	167.80	169.08	169.32	170.28	153.53	
CE-48	162.45	165.79	168.03	166.65	169.87	172.11	156.53	
CE-49	152.83	153.45	155.55	156.49	159.92	159.97	144.93	
CE-50	169.38	176.28	179.27	182.35	188.70	187.56	169.96	
N	10	10	10	10	10	10	10	

Appendix 6-2. Individual body weights of female rats in exposure group (continued)

INDIVIDUAL BODY WEIGHTS (Grams)								
EXPOSURE 13WEEKS								
STUDY ID : GT14-00042	GROUP : Low				SEX : FEMALE			
	DOSE : 0.2 mg/m ³							
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
LE-51	127.32	126.21	131.57	133.34	132.90	140.36	145.07	147.65
LE-52	132.21	134.36	138.13	139.70	141.02	147.85	150.94	153.97
LE-53	133.44	137.12	145.47	149.80	154.60	158.82	164.73	169.74
LE-54	135.40	137.21	141.06	141.10	139.83	139.24	140.85	140.18
LE-55	136.23	139.75	142.35	146.46	151.84	151.15	150.12	149.60
LE-56	137.77	144.44	156.21	162.67	167.11	168.11	174.72	177.61
LE-57	138.95	142.33	149.11	152.46	151.45	157.78	157.01	161.23
LE-58	139.94	143.35	156.16	160.57	160.09	165.00	168.35	176.58
LE-59	141.06	143.77	152.73	154.72	158.50	165.79	168.22	172.20
LE-60	144.65	145.14	152.24	156.98	160.45	168.22	170.78	174.72
N	10	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice	
LE-51	152.23	151.58	153.42	152.65	154.97	156.37	139.30	
LE-52	164.60	166.00	168.85	168.15	171.65	165.76	147.62	
LE-53	171.53	177.61	184.48	182.28	183.55	186.13	169.99	
LE-54	145.81	147.55	148.12	152.61	151.50	154.16	138.98	
LE-55	152.72	155.89	159.42	164.26	167.61	171.56	159.03	
LE-56	183.60	185.14	187.96	186.25	189.98	192.49	178.50	
LE-57	164.93	167.06	170.44	170.92	173.94	169.03	154.96	
LE-58	181.93	184.86	187.85	188.13	186.79	190.38	171.19	
LE-59	173.55	181.78	184.80	184.21	191.72	188.71	174.67	
LE-60	179.56	183.91	188.90	186.28	189.49	192.35	176.96	
N	10	10	10	10	10	10	10	

Appendix 6-2. Individual body weights of female rats in exposure group (continued)

INDIVIDUAL BODY WEIGHTS (Grams)								
EXPOSURE 13WEEKS								
STUDY ID : GT14-00042	GROUP : Medium				SEX : FEMALE			
	DOSE : 0.5 mg/m ³							
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
ME-61	127.91	130.21	133.94	136.57	138.03	144.52	144.94	148.14
ME-62	131.81	138.95	144.21	144.85	144.75	148.26	146.84	146.35
ME-63	133.45	135.14	139.11	143.85	145.93	149.89	149.42	149.81
ME-64	134.37	134.07	145.83	153.58	161.14	167.35	170.08	173.56
ME-65	137.10	146.25	154.42	155.28	154.55	160.62	162.10	170.06
ME-66	137.58	139.37	142.72	147.78	149.49	153.35	158.43	161.58
ME-67	139.06	139.93	143.39	146.74	146.38	147.81	151.06	150.08
ME-68	139.88	145.49	155.91	151.18	158.64	160.70	161.39	166.26
ME-69	141.14	139.95	145.26	151.20	154.41	158.98	161.48	165.24
ME-70	144.31	148.55	158.88	161.64	164.97	168.63	171.02	175.35
N	10	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice	
ME-61	153.63	153.76	156.91	155.50	157.51	158.85	145.83	
ME-62	149.76	152.16	157.27	160.71	161.38	159.44	143.88	
ME-63	156.81	160.81	163.69	164.54	168.13	168.74	151.71	
ME-64	179.87	184.23	188.34	187.04	188.61	191.58	173.81	
ME-65	173.99	173.33	180.13	177.99	182.91	186.15	168.05	
ME-66	163.22	165.55	165.04	169.46	170.37	174.49	156.08	
ME-67	158.66	161.52	163.31	166.12	168.81	170.74	157.80	
ME-68	165.83	175.43	175.85	180.54	180.65	175.94	166.87	
ME-69	170.48	178.16	180.78	184.55	188.08	186.11	168.84	
ME-70	177.77	183.94	185.02	185.15	189.07	192.49	173.40	
N	10	10	10	10	10	10	10	

Appendix 6-2. Individual body weights of female rats in exposure group (continued)

INDIVIDUAL BODY WEIGHTS (Grams)								
EXPOSURE 13WEEKS								
STUDY ID : GT14-00042	GROUP : High				SEX : FEMALE			
	DOSE : 1.0 mg/m ³							
ANIMAL #	0 DAY	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
HE-71	128.70	127.65	134.34	141.03	146.85	151.84	152.87	155.74
HE-72	131.29	136.72	143.22	150.85	154.37	158.30	155.11	159.41
HE-73	133.68	136.92	143.40	147.59	154.07	162.31	160.64	165.92
HE-74	133.69	134.54	141.87	143.46	148.03	149.64	151.74	154.60
HE-75	137.23	139.86	144.82	149.49	150.52	154.01	153.64	157.86
HE-76	137.49	137.11	140.24	144.81	148.34	152.51	153.21	156.07
HE-77	139.22	142.44	152.84	160.17	167.17	170.90	170.09	175.21
HE-78	139.50	138.21	148.90	150.27	155.99	156.83	157.59	161.43
HE-79	142.24	145.56	155.96	160.42	162.01	163.52	166.57	169.05
HE-80	143.29	140.94	146.12	149.10	148.73	155.13	155.06	156.69
N	10	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice	
HE-71	156.73	163.07	164.77	166.80	169.54	169.77	153.64	
HE-72	164.53	168.31	169.11	169.86	166.90	169.82	161.72	
HE-73	167.63	176.55	175.78	181.47	181.16	188.59	170.41	
HE-74	159.96	161.68	161.19	163.97	165.94	168.13	151.76	
HE-75	163.08	165.08	166.08	166.44	167.45	170.27	153.27	
HE-76	161.57	163.64	167.18	169.10	167.93	165.96	150.65	
HE-77	179.61	187.51	190.55	186.73	192.04	193.61	177.14	
HE-78	165.26	171.43	173.72	175.68	178.68	177.84	161.04	
HE-79	174.11	177.52	182.05	179.61	184.34	186.04	170.68	
HE-80	160.19	163.44	168.88	167.13	168.81	168.17	151.74	
N	10	10	10	10	10	10	10	

Appendix 6-3. Individual body weights of male rats in recovery group

INDIVIDUAL BODY WEIGHTS (Grams)								
RECOVERY 13WEEKS								
STUDY ID: GT14-00042		GROUP : Control				SEX : MALE		
		DOSE : 0 mg/m³						
ANIMAL #	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week	8 Week
CR-1	318.18	323.57	330.06	337.94	344.78	354.31	356.40	358.07
CR-2	325.59	327.94	333.84	335.52	344.03	344.80	349.40	352.24
CR-3	323.77	329.58	337.86	340.58	347.71	349.72	355.05	352.27
CR-4	316.47	322.32	333.85	338.27	347.37	354.37	357.74	364.68
CR-5	334.35	341.36	344.19	360.20	364.20	370.97	374.00	375.59
N	5	5	5	5	5	5	5	5
ANIMAL #	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice		
CR-1	364.37	373.12	363.65	374.68	371.84	350.65		
CR-2	355.84	359.50	362.87	364.77	370.92	348.41		
CR-3	362.11	363.54	367.76	373.38	377.87	357.25		
CR-4	364.36	372.29	377.81	381.59	382.71	360.80		
CR-5	375.37	383.31	388.11	392.07	391.61	369.49		
N	5	5	5	5	5	5		
STUDY ID: GT14-00042		GROUP : Low				SEX : MALE		
		DOSE : 0.2 mg/m³						
ANIMAL #	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week	8 Week
LR-6	319.74	329.77	334.73	341.84	346.79	350.55	356.06	344.31
LR-7	317.03	317.39	328.56	333.48	338.97	341.29	346.58	352.03
LR-8	336.86	350.29	357.67	363.12	369.11	370.56	377.63	378.43
LR-9	321.63	332.44	337.77	347.32	353.50	353.68	358.85	364.34
LR-10	320.62	327.41	337.04	346.42	357.52	362.58	368.17	374.93
N	5	5	5	5	5	5	5	5
ANIMAL #	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice		
LR-6	359.96	365.80	366.98	368.59	373.02	350.58		
LR-7	358.87	358.96	365.40	368.77	369.99	345.72		
LR-8	386.60	388.89	391.71	392.23	396.87	373.82		
LR-9	373.54	371.94	378.53	376.37	382.32	361.70		
LR-10	377.56	384.37	388.00	391.25	388.07	368.55		
N	5	5	5	5	5	5		

Appendix 6-3. Individual body weights of male rats in recovery group (continued)

INDIVIDUAL BODY WEIGHTS (Grams)								
RECOVERY 13WEEKS								
STUDY ID: GT14-00042		GROUP : Medium				SEX : MALE		
		DOSE : 0.5 mg/m ³						
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week	8 Week
MR-11	312.82	318.33	330.80	335.08	340.71	343.73	355.39	357.39
MR-12	277.97	285.74	293.05	294.82	301.12	304.26	311.15	315.12
MR-13	316.03	329.26	337.38	343.24	349.17	357.27	358.90	368.08
MR-14	346.64	357.48	363.77	366.54	375.38	379.96	383.56	391.85
MR-15	304.91	314.30	325.36	330.44	338.78	346.93	348.80	360.13
N	5	5	5	5	5	5	5	5
ANIMAL #	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice		
MR-11	360.87	362.91	368.06	370.89	336.83	321.10		
MR-12	320.10	322.74	326.13	331.83	333.75	309.61		
MR-13	375.24	376.45	382.65	383.80	389.08	364.48		
MR-14	393.91	398.30	401.66	406.41	403.81	379.02		
MR-15	361.79	364.59	371.15	370.12	376.19	352.45		
N	5	5	5	5	5	5		
STUDY ID: GT14-00042		GROUP : High				SEX : MALE		
		DOSE : 1.0 mg/m ³						
ANIMAL #	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week	8 Week
HR-16	306.83	317.58	326.21	327.88	331.87	337.83	341.42	348.89
HR-17	312.70	322.45	329.26	333.19	338.17	344.62	348.89	351.24
HR-18	312.97	326.39	337.94	340.43	351.13	356.75	365.31	371.78
HR-19	300.38	306.52	311.37	323.45	327.84	336.20	339.36	344.27
HR-20	341.21	347.42	354.19	362.10	367.86	375.02	377.28	388.85
N	5	5	5	5	5	5	5	5
ANIMAL #	9 Week	10 Week	11 Week	12 Week	13 Week	Sacrifice		
HR-16	345.26	356.72	358.24	360.90	358.44	335.22		
HR-17	354.53	354.77	357.16	363.46	363.41	342.69		
HR-18	373.06	380.41	382.81	388.47	392.38	367.90		
HR-19	349.49	352.46	352.74	354.94	357.42	335.54		
HR-20	386.81	385.40	389.89	391.64	393.22	369.83		
N	5	5	5	5	5	5		

Appendix 7-1. Individual food consumption of male rats in exposure group

INDIVIDUAL FOOD CONSUMPTION (Grams)							
EXPOSURE 13WEEKS							
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
CE-1	15.83	16.26	15.54	17.01	18.70	18.67	15.52
CE-2	17.31	17.07	16.34	16.43	20.63	18.74	15.27
CE-3	15.87	17.04	18.89	17.19	21.63	18.52	17.09
CE-4	14.28	16.49	16.61	15.74	18.54	19.66	18.72
CE-5	16.01	17.34	18.80	16.69	20.81	19.51	15.98
CE-6	18.22	18.28	19.53	15.89	22.50	18.93	16.80
CE-7	15.86	17.40	18.13	15.89	23.48	18.80	17.61
CE-8	16.15	15.49	17.94	16.72	19.74	20.37	15.87
CE-9	18.39	18.72	18.85	18.26	19.86	17.74	15.84
CE-10	19.65	18.07	17.24	18.35	15.95	17.35	16.20
N	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
CE-1	13.79	15.57	13.21	16.04	18.70	17.63	
CE-2	19.30	18.94	19.02	15.55	18.98	17.39	
CE-3	19.58	19.31	22.01	18.33	17.91	18.47	
CE-4	18.88	17.29	19.69	17.73	19.19	17.37	
CE-5	19.70	17.89	20.01	18.46	20.36	18.90	
CE-6	18.57	18.23	18.09	19.13	20.84	19.00	
CE-7	21.24	19.75	19.34	13.49	16.94	17.25	
CE-8	18.71	17.14	18.58	14.20	18.18	16.64	
CE-9	15.45	17.58	18.00	19.69	3.92	20.57	
CE-10	19.71	19.52	19.07	15.46	15.23	16.71	
N	10	10	10	10	10	10	

Appendix 7-1. Individual food consumption of male rats in exposure group (continued)

INDIVIDUAL FOOD CONSUMPTION (Grams)							
EXPOSURE 13WEEKS							
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
LE-11	17.85	18.09	18.15	18.17	17.68	20.21	15.81
LE-12	12.11	16.02	16.72	16.59	21.21	20.77	16.58
LE-13	16.99	18.01	15.90	18.51	21.19	18.61	17.62
LE-14	18.29	17.25	16.23	16.40	17.88	19.49	17.16
LE-15	18.10	16.38	18.63	18.54	21.45	21.53	19.47
LE-16	18.16	17.92	18.47	15.89	18.15	15.30	16.64
LE-17	16.92	20.14	16.68	16.07	17.96	20.62	16.12
LE-18	16.14	17.90	17.71	17.58	22.16	21.76	12.27
LE-19	14.69	18.90	17.83	18.72	21.19	20.25	17.93
LE-20	16.57	18.82	19.66	19.60	14.52	19.22	19.35
N	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
LE-11	15.72	17.05	17.42	16.35	17.53	14.77	
LE-12	19.45	19.28	17.99	18.40	17.27	17.80	
LE-13	18.91	17.31	19.40	20.36	21.41	18.14	
LE-14	18.84	18.98	18.71	17.45	16.21	19.35	
LE-15	21.21	19.72	19.02	19.08	18.92	19.91	
LE-16	18.63	18.87	18.87	18.66	19.35	23.41	
LE-17	18.34	17.05	18.23	17.20	17.97	16.82	
LE-18	19.46	18.73	18.55	20.54	21.70	20.94	
LE-19	20.28	17.54	19.05	16.59	20.59	18.65	
LE-20	16.36	20.09	19.90	16.81	21.20	20.01	
N	10	10	10	10	10	10	

Appendix 7-1. Individual food consumption of male rats in exposure group (continued)

INDIVIDUAL FOOD CONSUMPTION (Grams)							
EXPOSURE 13WEEKS							
STUDY ID : GT14-00042	GROUP : Medium				SEX : MALE		
	DOSE : 0.5 mg/m ³						
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
ME-21	14.13	15.84	16.45	16.93	19.79	18.61	17.44
ME-22	16.59	18.26	17.40	17.81	20.53	19.54	17.60
ME-23	15.37	15.80	17.97	17.70	19.39	17.40	19.11
ME-24	15.12	18.66	19.48	18.35	19.45	17.59	18.31
ME-25	15.14	15.33	11.14	15.66	18.94	19.61	17.14
ME-26	16.70	19.89	18.46	18.11	22.37	21.15	20.53
ME-27	17.22	17.09	18.75	15.52	15.34	18.85	17.76
ME-28	16.56	20.21	20.40	18.01	20.19	18.90	17.49
ME-29	19.17	18.84	21.18	19.66	20.96	20.05	18.74
ME-30	17.78	18.53	17.66	19.06	20.02	20.87	20.32
N	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
ME-21	16.88	16.08	13.10	17.25	18.19	18.41	
ME-22	17.00	17.68	16.46	18.23	16.01	18.27	
ME-23	19.60	19.69	15.21	18.37	20.30	16.13	
ME-24	17.89	17.81	17.80	13.45	19.71	16.98	
ME-25	16.18	16.23	14.00	17.82	17.46	15.33	
ME-26	16.17	17.74	22.14	20.00	-	-	
ME-27	17.80	22.01	16.90	18.96	19.33	19.31	
ME-28	18.46	18.49	17.34	16.10	19.86	19.25	
ME-29	12.65	19.22	18.08	20.31	20.65	22.36	
ME-30	17.35	17.62	17.96	18.99	19.57	18.63	
N	10	10	10	10	9	9	

Appendix 7-1. Individual food consumption of male rats in exposure group (continued)

INDIVIDUAL FOOD CONSUMPTION (Grams)							
EXPOSURE 13WEEKS							
STUDY ID : GT14-00042	GROUP : High			SEX : MALE			
	DOSE : 1.0 mg/m ³						
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
HE-31	16.30	15.91	16.27	15.04	17.87	16.15	16.96
HE-32	16.60	14.91	17.02	17.16	20.88	19.13	18.21
HE-33	19.86	18.98	19.93	17.73	19.78	19.20	18.30
HE-34	15.32	13.83	14.96	13.65	19.91	16.91	15.38
HE-35	17.41	17.85	19.63	18.66	22.89	20.69	20.74
HE-36	17.36	18.51	19.49	19.21	22.11	21.37	20.58
HE-37	16.75	17.52	17.66	13.92	22.04	20.52	18.71
HE-38	20.45	19.57	20.00	18.77	23.00	21.79	16.57
HE-39	17.79	17.69	17.23	18.15	20.92	21.06	19.74
HE-40	17.91	19.65	21.74	19.30	20.94	20.05	19.23
N	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
HE-31	17.35	18.76	15.42	16.31	15.96	17.36	
HE-32	20.82	18.08	19.43	15.40	17.71	18.31	
HE-33	19.24	16.75	15.21	17.56	17.39	17.08	
HE-34	16.06	16.45	16.73	17.21	18.54	18.25	
HE-35	21.09	17.46	18.19	19.92	18.23	19.06	
HE-36	20.70	21.16	20.10	21.43	20.31	21.03	
HE-37	16.91	20.88	20.04	18.75	18.59	18.15	
HE-38	19.50	21.35	20.01	21.44	22.57	17.84	
HE-39	19.18	18.58	17.34	20.10	19.55	17.36	
HE-40	18.21	19.10	20.18	15.59	17.37	19.40	
N	10	10	10	10	10	10	

Appendix 7-1. Individual food consumption of male rats in exposure group (continued)

INDIVIDUAL FOOD CONSUMPTION (Grams)							
EXPOSURE 13WEEKS							
STUDY ID : GT14-00042		GROUP : Control			SEX : MALE		
		DOSE : 0 mg/m ³					
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
CR-1	14.67	16.82	19.59	18.70	21.92	20.87	17.79
CR-2	15.05	15.94	17.81	17.45	21.81	18.58	19.77
CR-3	17.01	18.52	20.80	20.18	22.71	20.75	19.00
CR-4	16.11	13.86	18.01	18.54	20.98	19.90	18.78
CR-5	18.75	20.08	19.85	18.36	22.44	21.98	18.44
N	5	5	5	5	5	5	5
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
CR-1	16.58	17.24	21.03	18.32	19.43	20.28	
CR-2	19.72	18.47	19.49	20.20	22.23	19.27	
CR-3	21.09	21.06	22.93	19.09	20.91	19.77	
CR-4	20.33	17.84	19.42	18.93	17.56	18.44	
CR-5	19.82	21.31	19.44	19.56	18.24	20.83	
N	5	5	5	5	5	5	
STUDY ID : GT14-00042		GROUP : Low			SEX : MALE		
		DOSE : 0.2 mg/m ³					
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
LR-6	15.87	16.78	18.78	19.25	22.09	22.94	20.23
LR-7	16.18	17.46	17.94	19.87	19.16	19.98	16.62
LR-8	15.26	16.67	17.69	20.13	21.46	20.78	19.50
LR-9	13.98	13.60	15.91	17.63	19.16	19.11	17.02
LR-10	14.02	14.60	19.18	17.98	23.24	20.80	18.12
N	5	5	5	5	5	5	5
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
LR-6	18.51	20.20	21.03	19.79	14.93	19.43	
LR-7	18.79	16.98	19.54	19.35	20.17	18.79	
LR-8	19.37	19.66	21.01	19.98	19.27	17.04	
LR-9	20.28	17.36	18.30	20.41	18.53	18.23	
LR-10	21.66	19.97	17.84	20.89	20.74	20.83	
N	5	5	5	5	5	5	

Appendix 7-1. Individual food consumption of male rats in exposure group (continued)

INDIVIDUAL FOOD CONSUMPTION (Grams)							
EXPOSURE 13WEEKS							
STUDY ID : GT14-00042		GROUP : Medium				SEX : MALE	
		DOSE : 0.5 mg/m ³					
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
MR-11	16.39	16.14	18.03	17.67	20.80	21.32	20.57
MR-12	16.26	16.57	18.09	16.35	19.32	17.94	15.96
MR-13	18.08	18.40	15.58	18.88	21.82	20.45	18.26
MR-14	15.60	18.13	18.34	20.09	22.17	21.67	19.76
MR-15	17.48	17.59	17.59	16.22	22.67	19.17	17.44
N	5	5	5	5	5	5	5
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
MR-11	20.40	18.10	18.94	15.36	15.60	16.59	
MR-12	15.81	14.55	16.36	17.99	16.83	14.88	
MR-13	18.17	15.59	19.58	19.26	20.61	19.59	
MR-14	19.23	20.53	20.83	19.81	20.14	20.73	
MR-15	20.14	20.04	19.25	22.36	17.70	14.07	
N	5	5	5	5	5	5	
STUDY ID : GT14-00042		GROUP : High				SEX : MALE	
		DOSE : 1.0 mg/m ³					
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
HR-16	15.65	14.22	17.85	14.66	18.64	17.89	15.92
HR-17	16.29	16.26	18.49	17.25	21.12	18.77	18.06
HR-18	17.73	14.87	18.03	16.75	20.39	18.96	16.88
HR-19	19.82	17.00	18.07	16.05	20.83	18.97	16.48
HR-20	15.51	18.16	18.06	21.26	21.94	22.68	19.33
N	5	5	5	5	5	5	5
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
HR-16	15.63	17.01	17.88	18.05	15.75	16.07	
HR-17	17.91	17.04	18.44	16.32	18.76	18.87	
HR-18	14.94	17.80	18.45	20.27	19.55	18.40	
HR-19	17.20	14.89	15.24	15.47	17.42	14.99	
HR-20	21.10	18.19	21.87	21.48	19.19	15.18	
N	5	5	5	5	5	5	

Appendix 7-2. Individual food consumption of female rats in exposure group

INDIVIDUAL FOOD CONSUMPTION (Grams)							
EXPOSURE 13WEEKS							
STUDY ID : GT14-00042	GROUP : Control			SEX : FEMALE			
	DOSE : 0 mg/m ³						
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
CE-41	12.92	12.91	11.78	10.08	13.94	12.77	11.29
CE-42	13.19	14.07	12.95	12.22	15.52	11.81	14.79
CE-43	12.87	14.24	13.80	12.18	15.03	12.57	12.85
CE-44	11.51	14.74	10.90	10.67	13.86	10.80	13.55
CE-45	12.12	13.69	14.49	12.62	17.24	15.30	13.81
CE-46	11.53	11.05	12.73	12.91	15.16	14.01	13.75
CE-47	12.83	11.33	11.82	10.79	15.78	13.66	12.93
CE-48	14.39	12.34	12.25	13.16	14.61	12.19	13.48
CE-49	14.49	14.17	11.38	11.40	11.80	10.99	10.59
CE-50	11.48	12.68	14.02	11.62	13.72	12.44	10.92
N	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
CE-41	11.57	10.74	13.37	12.27	10.42	11.15	
CE-42	10.99	12.89	11.39	12.27	14.62	9.08	
CE-43	11.28	13.39	13.92	11.77	12.78	13.53	
CE-44	10.95	11.29	11.21	10.84	13.00	12.01	
CE-45	14.92	13.69	13.97	11.84	15.61	13.79	
CE-46	12.85	12.60	13.07	13.44	13.12	13.49	
CE-47	12.76	12.83	12.70	12.09	12.63	12.55	
CE-48	12.77	10.98	12.31	8.97	11.48	12.26	
CE-49	12.09	10.72	10.42	10.79	11.30	10.20	
CE-50	13.57	13.51	12.85	12.26	14.15	11.83	
N	10	10	10	10	10	10	

Appendix 7-2. Individual food consumption of female rats in exposure group (continued)

INDIVIDUAL FOOD CONSUMPTION (Grams)							
EXPOSURE 13WEEKS							
STUDY ID : GT14-00042	GROUP : Low			SEX : FEMALE			
	DOSE : 0.2 mg/m ³						
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
LE-51	9.87	9.84	10.19	9.96	14.06	13.58	10.50
LE-52	12.10	10.58	9.99	9.72	16.59	13.38	10.35
LE-53	14.35	15.57	14.54	13.47	16.79	14.26	14.39
LE-54	11.34	12.88	11.74	9.57	10.53	11.35	8.51
LE-55	13.75	12.81	11.25	10.30	10.70	10.49	10.50
LE-56	14.00	13.84	13.80	13.30	14.38	15.84	14.93
LE-57	14.38	13.00	12.25	11.36	15.08	12.48	10.84
LE-58	14.48	15.90	12.77	12.39	14.82	14.66	14.07
LE-59	14.96	14.29	13.62	12.94	16.02	13.65	15.29
LE-60	13.66	12.39	12.87	13.71	14.18	12.83	13.33
N	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
LE-51	12.13	9.84	12.27	10.71	11.85	11.64	
LE-52	13.13	11.69	12.60	11.34	12.81	8.95	
LE-53	13.28	13.70	14.77	12.82	13.55	12.84	
LE-54	11.70	9.04	9.47	11.00	9.04	10.39	
LE-55	8.79	8.59	10.35	9.54	10.54	10.66	
LE-56	15.48	14.06	12.46	12.25	12.92	13.66	
LE-57	12.53	10.52	13.28	11.60	12.01	9.43	
LE-58	15.33	13.45	13.84	13.68	12.09	13.94	
LE-59	14.04	15.83	14.25	13.28	15.92	11.62	
LE-60	14.84	12.98	14.50	12.51	13.51	13.43	
N	10	10	10	10	10	10	

Appendix 7-2. Individual food consumption of female rats in exposure group (continued)

INDIVIDUAL FOOD CONSUMPTION (Grams)							
EXPOSURE 13WEEKS							
STUDY ID : GT14-00042	GROUP : Medium				SEX : FEMALE		
	DOSE : 0.5 mg/m ³						
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
ME-61	10.69	10.30	10.15	9.73	14.28	10.50	9.97
ME-62	13.49	11.44	10.24	9.77	13.04	11.44	9.95
ME-63	13.18	11.49	12.71	11.35	13.93	11.83	10.39
ME-64	13.43	13.76	13.79	12.87	16.63	13.79	14.90
ME-65	15.41	12.89	13.13	11.26	15.20	12.23	14.90
ME-66	12.00	11.47	12.28	10.82	14.37	13.88	11.83
ME-67	10.69	11.57	11.88	11.10	13.68	12.82	8.70
ME-68	12.56	14.27	11.38	13.85	15.87	12.74	15.04
ME-69	12.43	11.65	14.46	12.73	14.35	13.31	13.33
ME-70	14.54	14.21	11.53	11.55	14.87	12.64	12.62
N	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
ME-61	11.81	10.27	12.17	10.57	10.96	10.29	
ME-62	10.44	11.91	11.53	12.18	12.28	9.96	
ME-63	12.04	12.50	11.27	10.75	11.95	12.38	
ME-64	12.57	13.52	13.93	14.63	13.50	14.22	
ME-65	14.92	12.45	13.96	13.03	14.07	14.75	
ME-66	11.24	12.85	10.48	12.76	11.61	13.74	
ME-67	14.24	12.13	12.44	13.23	14.67	12.52	
ME-68	9.74	15.82	11.93	13.77	11.55	13.11	
ME-69	12.86	14.59	12.79	14.16	14.47	13.16	
ME-70	10.55	12.70	13.31	10.97	13.61	13.83	
N	10	10	10	10	10	10	

Appendix 7-2. Individual food consumption of female rats in exposure group (continued)

INDIVIDUAL FOOD CONSUMPTION (Grams)							
EXPOSURE 13WEEKS							
STUDY ID : GT14-00042	GROUP : High			SEX : FEMALE			
	DOSE : 1.0 mg/m ³						
ANIMAL #	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week
HE-71	10.87	11.64	13.08	11.57	14.72	10.74	11.82
HE-72	14.27	11.44	13.20	12.03	17.17	11.85	14.04
HE-73	12.95	13.37	13.27	12.09	16.76	11.46	12.77
HE-74	12.76	13.20	11.35	12.08	13.79	11.49	12.47
HE-75	13.52	11.81	13.55	11.58	13.81	10.69	11.40
HE-76	14.55	11.40	12.20	11.93	14.13	11.67	12.25
HE-77	15.21	14.02	13.82	13.56	16.77	12.39	16.25
HE-78	13.87	13.37	13.37	11.89	16.17	13.00	13.88
HE-79	16.78	15.39	14.92	11.93	16.93	14.29	13.63
HE-80	14.79	15.34	11.87	10.56	15.33	12.37	12.22
N	10	10	10	10	10	10	10
ANIMAL #	8 Week	9 Week	10 Week	11 Week	12 Week	13 Week	
HE-71	11.58	11.90	13.06	12.73	12.68	13.58	
HE-72	12.13	14.14	13.11	14.90	13.04	11.31	
HE-73	10.53	13.77	11.82	14.34	10.49	15.14	
HE-74	11.19	11.16	10.81	12.30	12.41	14.46	
HE-75	11.79	12.40	10.23	10.81	10.04	13.02	
HE-76	12.38	12.61	11.25	12.76	11.70	10.60	
HE-77	14.52	15.41	15.77	12.87	15.38	14.93	
HE-78	13.30	13.47	14.22	13.03	14.02	12.73	
HE-79	14.42	12.72	13.64	15.56	14.76	13.50	
HE-80	11.80	11.89	12.21	11.78	10.85	9.98	
N	10	10	10	10	10	10	

Appendix 7-3. Individual food consumption of male rats in recovery group

INDIVIDUAL FOOD CONSUMPTION (Grams)								
RECOVERY 13WEEKS								
STUDY ID: GT14-00042		GROUP : Control				SEX : MALE		
		DOSE : 0 mg/m ³						
ANIMAL #	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week	8 Week
CR-1	22.55	21.83	23.18	23.08	22.14	22.22	23.11	20.87
CR-2	18.51	18.77	21.92	22.99	21.05	21.98	21.43	21.63
CR-3	23.02	22.00	24.67	24.34	25.10	20.95	22.32	22.41
CR-4	21.65	20.00	21.76	24.43	20.81	23.52	20.65	24.03
CR-5	23.74	23.11	20.72	25.36	22.99	24.32	24.05	22.60
N	5	5	5	5	5	5	5	5
ANIMAL #	9 Week	10 Week	11 Week	12 Week	13 Week			
CR-1	20.91	24.25	20.11	23.15	21.43			
CR-2	20.41	21.95	20.86	20.43	21.38			
CR-3	22.17	23.51	21.03	22.38	22.44			
CR-4	19.78	22.56	22.77	22.57	21.66			
CR-5	20.84	25.65	23.13	24.03	22.96			
N	5	5	5	5	5			
STUDY ID: GT14-00042		GROUP : Low				SEX : MALE		
		DOSE : 0.2 mg/m ³						
ANIMAL #	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week	8 Week
LR-6	23.11	23.39	20.10	23.54	22.42	24.09	22.23	19.92
LR-7	22.53	19.19	19.74	20.70	20.78	20.72	20.68	23.24
LR-8	28.96	26.17	22.19	22.77	21.87	22.19	23.09	21.14
LR-9	23.32	22.20	21.28	21.25	22.72	20.67	20.97	19.80
LR-10	21.76	22.11	23.55	24.43	26.37	25.25	25.80	25.41
N	5	5	5	5	5	5	5	5
ANIMAL #	9 Week	10 Week	11 Week	12 Week	13 Week			
LR-6	21.31	19.05	18.81	20.13	22.46			
LR-7	22.18	20.29	19.87	22.04	21.60			
LR-8	21.28	23.00	22.71	21.50	20.57			
LR-9	19.27	20.43	22.05	19.34	24.03			
LR-10	23.97	25.87	22.70	23.59	23.47			
N	5	5	5	5	5			

Appendix 7-3. Individual food consumption of male rats in recovery group (continued)

INDIVIDUAL FOOD CONSUMPTION (Grams)								
RECOVERY 13WEEKS								
STUDY ID: GT14-00042		GROUP : Medium				SEX : MALE		
		DOSE : 0.5 mg/m ³						
ANIMAL #	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week	8 Week
MR-11	24.31	22.43	24.42	24.11	22.41	22.89	21.95	21.16
MR-12	21.40	18.24	20.50	18.80	21.21	17.57	20.59	18.56
MR-13	23.28	21.99	22.21	22.58	23.56	24.13	22.20	24.16
MR-14	26.48	23.29	26.13	24.35	26.74	26.39	25.65	25.64
MR-15	23.61	23.91	23.73	23.10	26.53	25.99	24.29	24.37
N	5	5	5	5	5	5	5	5
ANIMAL #	9 Week	10 Week	11 Week	12 Week	13 Week			
MR-11	22.51	23.64	23.56	20.57	9.95			
MR-12	20.00	18.83	20.08	20.74	21.75			
MR-13	24.86	23.50	24.86	23.91	25.70			
MR-14	25.20	24.49	24.65	24.53	26.16			
MR-15	23.59	21.39	27.17	23.50	24.44			
N	5	5	5	5	5			
STUDY ID: GT14-00042		GROUP : High				SEX : MALE		
		DOSE : 1.0 mg/m ³						
ANIMAL #	1Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week	8 Week
HR-16	18.90	23.73	21.37	19.07	20.01	20.61	21.73	21.64
HR-17	21.06	22.80	20.93	21.32	22.65	21.17	21.90	20.90
HR-18	22.83	23.26	24.39	21.27	24.14	22.59	23.91	23.01
HR-19	21.81	21.19	20.76	17.78	20.46	20.95	21.66	22.38
HR-20	26.15	22.79	23.68	24.64	25.67	25.08	24.14	26.55
N	5	5	5	5	5	5	5	5
ANIMAL #	9 Week	10 Week	11 Week	12 Week	13 Week			
HR-16	19.73	22.07	20.03	18.83	18.61			
HR-17	23.32	19.43	21.58	19.58	20.81			
HR-18	22.33	24.75	22.77	22.69	26.32			
HR-19	20.17	19.07	21.88	20.28	22.66			
HR-20	21.64	22.21	22.87	23.40	22.89			
N	5	5	5	5	5			

Appendix 8-1. Individual urinalysis of male rats in exposure group

INDIVIDUAL URINALYSIS EXPOSURE 13WEEKS										
STUDY ID : GT14-00042			GROUP : Control					SEX : MALE		
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
CE-1	negative	negative	1+	1.025	trace	6.5	2+	0.2	negative	trace
CE-2	trace	negative	1+	1.030	trace	6.0	2+	0.2	positive	trace
CE-3	negative	negative	1+	1.030	negative	6.5	2+	0.2	negative	trace
CE-4	negative	negative	1+	1.030	trace	6.5	3+	0.2	positive	trace
CE-5	negative	negative	1+	1.030	negative	7.0	2+	0.2	negative	trace
N	5	5	5	5	5	5	5	5	5	5
STUDY ID : GT14-00042			GROUP : Low					SEX : MALE		
			DOSE : 0.2 mg/m ³							
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
LE-11	negative	negative	1+	1.020	negative	7.0	2+	0.2	negative	trace
LE-12	negative	negative	1+	1.020	negative	7.0	2+	0.2	negative	trace
LE-13	negative	negative	trace	1.015	trace	7.0	1+	0.2	negative	trace
LE-14	negative	negative	1+	1.020	negative	7.0	2+	0.2	negative	trace
LE-15	negative	negative	1+	1.030	negative	6.5	2+	0.2	negative	trace
N	5	5	5	5	5	5	5	5	5	5
STUDY ID : GT14-00042			GROUP : Medium					SEX : MALE		
			DOSE : 0.5 mg/m ³							
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
ME-21	negative	negative	trace	1.015	trace	7.5	2+	0.2	negative	trace
ME-22	negative	negative	trace	1.015	negative	7.5	1+	0.2	negative	trace
ME-23	negative	negative	negative	1.005	negative	8.0	1+	0.2	negative	trace
ME-24	negative	negative	1+	1.030	trace	6.5	2+	0.2	negative	trace
ME-25	negative	negative	trace	1.015	trace	7.5	2+	0.2	negative	trace
N	5	5	5	5	5	5	5	5	5	5
STUDY ID : GT14-00042			GROUP : High					SEX : MALE		
			DOSE : 1.0 mg/m ³							
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
HE-31	negative	negative	trace	1.015	negative	8.0	1+	0.2	negative	trace
HE-32	negative	negative	trace	1.015	trace	8.0	2+	0.2	negative	trace
HE-33	negative	negative	trace	1.015	trace	7.5	2+	0.2	negative	trace
HE-34	negative	negative	trace	1.010	trace	8.5	1+	0.2	negative	trace
HE-35	negative	negative	trace	1.020	trace	8.0	2+	0.2	negative	trace
N	5	5	5	5	5	5	5	5	5	5

1, Glucose; 2, Bilirubin; 3, Ketone; 4, Specific gravity; 5, Blood; 6, potential of hydrogen; 7, Protein; 8, Urobilinogen; 9, Nitrite; 10, Leukocyte

Appendix 8-2. Individual urinalysis of female rats in exposure group

INDIVIDUAL URINALYSIS EXPOSURE 13WEEKS										
STUDY ID : GT14-00042			GROUP : Control					SEX : FEMALE		
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
CE-41	negative	negative	negative	1.010	negative	8.0	negative	0.2	negative	negative
CE-42	negative	negative	negative	1.005	negative	8.0	negative	0.2	negative	negative
CE-43	negative	negative	negative	1.005	negative	7.0	negative	0.2	negative	negative
CE-44	negative	negative	negative	1.010	negative	8.0	negative	0.2	negative	negative
CE-45	negative	negative	negative	1.005	negative	7.0	negative	0.2	negative	negative
N	5	5	5	5	5	5	5	5	5	5
STUDY ID : GT14-00042			GROUP : Low					SEX : FEMALE		
			DOSE : 0.2 mg/m ³							
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
LE-51	negative	negative	negative	1.005	negative	8.0	negative	0.2	negative	negative
LE-52	negative	negative	negative	1.015	negative	8.5	negative	0.2	negative	negative
LE-53	negative	negative	negative	1.015	negative	7.5	negative	0.2	negative	negative
LE-54	negative	negative	negative	1.015	negative	8.0	trace	0.2	negative	negative
LE-55	negative	negative	negative	1.010	negative	8.0	negative	0.2	negative	negative
N	5	5	5	5	5	5	5	5	5	5
STUDY ID : GT14-00042			GROUP : Medium					SEX : FEMALE		
			DOSE : 0.5 mg/m ³							
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
ME-61	negative	negative	negative	1.015	negative	7.5	nagative	0.2	negative	negative
ME-62	negative	negative	negative	1.010	negative	8.0	nagative	0.2	negative	negative
ME-63	negative	negative	negative	1.005	negative	8.0	nagative	0.2	negative	negative
ME-64	negative	negative	negative	1.020	negative	7.5	trace	0.2	negative	negative
ME-65	negative	negative	negative	1.005	negative	7.5	nagative	0.2	negative	negative
N	5	5	5	5	5	5	5	5	5	5
STUDY ID : GT14-00042			GROUP : High					SEX : FEMALE		
			DOSE : 1.0 mg/m ³							
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
HE-71	negative	negative	negative	1.010	negative	8.5	negative	0.2	negative	negative
HE-72	negative	negative	negative	1.015	negative	8.0	negative	0.2	negative	negative
HE-73	negative	negative	negative	1.010	negative	8.5	1+	0.2	negative	negative
HE-74	negative	negative	negative	1.015	negative	8.0	trace	0.2	negative	negative
HE-75	negative	negative	negative	1.010	negative	8.0	nagative	0.2	negative	negative
N	5	5	5	5	5	5	5	5	5	5

1, Glucose; 2, Bilirubin; 3, Ketone; 4, Specific gravity; 5, Blood; 6, potential of hydrogen; 7, Protein; 8, Urobilinogen; 9, Nitrite; 10, Leukocyte

Appendix 8-3. Individual urinalysis of male rats in recovery group

INDIVIDUAL URINALYSIS RECOVERY 13WEEKS										
STUDY ID : GT14-00042			GROUP : Control					SEX : MALE		
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
	CR-1	negative	negative	trace	1.010	1+	6.5	2+	0.2	negative
CR-2	negative	negative	1+	1.015	trace	7.5	2+	0.2	negative	1+
CR-3	negative	1+	1+	1.025	2+	7.0	3+	0.2	negative	3+
CR-4	negative	negative	1+	1.025	trace	6.5	3+	0.2	negative	1+
CR-5	negative	negative	1+	1.025	3+	7.0	3+	0.2	negative	3+
N	5	5	5	5	5	5	5	5	5	5
STUDY ID : GT14-00042			GROUP : Low					SEX : MALE		
				DOSE : 0.2 mg/m ³						
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
LR-6	negative	negative	1+	1.015	negative	7.0	2+	0.2	negative	3+
LR-7	negative	negative	1+	1.025	trace	7.5	2+	0.2	negative	trace
LR-8	negative	negative	trace	1.015	negative	8.0	2+	0.2	negative	3+
LR-9	negative	negative	1+	1.025	negative	7.0	2+	1.0	negative	3+
LR-10	trace	negative	1+	1.030	negative	6.5	3+	0.2	negative	3+
N	5	5	5	5	5	5	5	5	5	5
STUDY ID : GT14-00042			GROUP : Medium					SEX : MALE		
				DOSE : 0.5 mg/m ³						
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
MR-11	negative	negative	trace	1.010	negative	8.0	2+	0.2	negative	3+
MR-12	negative	negative	1+	1.015	negative	7.5	2+	0.2	negative	1+
MR-13	negative	negative	1+	1.020	negative	6.5	3+	0.2	negative	1+
MR-14	negative	negative	1+	1.010	negative	7.5	2+	0.2	negative	1+
MR-15	negative	negative	trace	1.010	negative	7.0	1+	0.2	negative	trace
N	5	5	5	5	5	5	5	5	5	5
STUDY ID : GT14-00042			GROUP : High					SEX : MALE		
				DOSE : 1.0 mg/m ³						
ANIMAL ID	GLU ¹	BIL ²	KET ³	SG ⁴	BLO ⁵	Ph ⁶	PRO ⁷	URO ⁸	NIT ⁹	LEU ¹⁰
HR-16	negative	negative	1+	1.030	2+	6.5	3+	0.2	negative	3+
HR-17	negative	negative	trace	1.020	trace	7.0	3+	0.2	negative	3+
HR-18	negative	negative	trace	1.015	trace	6.5	2+	0.2	negative	3+
HR-19	negative	negative	1+	1.015	trace	7.0	2+	0.2	negative	3+
HR-20	negative	negative	1+	1.015	trace	7.0	3+	0.2	negative	3+
N	5	5	5	5	5	5	5	5	5	5

1, Glucose; 2, Bilirubin; 3, Ketone; 4, Specific gravity; 5, Blood; 6, potential of hydrogen; 7, Protein; 8, Urobilinogen; 9, Nitrite; 10, Leukocyte

Appendix 9-1. Individual ophthalmoscopic analysis sign of male rats in exposure group

OPHTHALMOSCOPIC ANALYSIS INDIVIDUAL DATA		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042		SEX : MALE
Animal		symptom
No.	Right	Left
CE-1	negative	negative
CE-2	negative	negative
CE-3	negative	negative
CE-4	negative	negative
CE-5	negative	negative
CE-6	negative	negative
CE-7	negative	negative
CE-8	negative	negative
CE-9	negative	negative
CE-10	negative	negative
HE-31	negative	negative
HE-32	negative	negative
HE-33	negative	negative
HE-34	negative	negative
HE-35	negative	negative
HE-36	negative	negative
HE-37	negative	negative
HE-38	negative	negative
HE-39	negative	negative
HE-40	negative	negative

Appendix 9-2. Individual ophthalmoscopic analysis sign of female rats in exposure group

OPHTHALMOSCOPIC ANALYSIS INDIVIDUAL DATA		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042		SEX : FEMALE
Animal		symptom
No.	Right	Left
CE-41	negative	negative
CE-42	negative	negative
CE-43	negative	negative
CE-44	negative	negative
CE-45	negative	negative
CE-46	negative	negative
CE-47	negative	negative
CE-48	negative	negative
CE-49	negative	negative
CE-50	negative	negative
HE-71	negative	negative
HE-72	negative	negative
HE-73	negative	negative
HE-74	negative	negative
HE-75	negative	negative
HE-76	negative	negative
HE-77	negative	negative
HE-78	negative	negative
HE-79	negative	negative
HE-80	negative	negative

Appendix 9-3. Individual ophthalmoscopic analysis sign of male rats in recovery group

OPHTHALMOSCOPIC ANALYSIS INDIVIDUAL DATA		
RECOVERY 13WEEKS		
STUDY ID : GT14-00042		SEX : MALE
Animal	symptom	
No.	Right	Left
CR-1	negative	negative
CR-2	negative	negative
CR-3	negative	negative
CR-4	negative	negative
CR-5	negative	negative
LR-6	negative	negative
LR-7	negative	negative
LR-8	negative	negative
LR-9	negative	negative
LR-10	negative	negative
MR-11	negative	negative
MR-12	negative	negative
MR-13	negative	negative
MR-14	negative	negative
MR-15	negative	negative
HR-16	negative	negative
HR-17	negative	negative
HR-18	negative	negative
HR-19	negative	negative
HR-20	negative	negative

Appendix 10-1. Individual gross findings of male rats in exposure group

INDIVIDUAL GROSS FINDINGS				
EXPOSURE 13WEEKS				
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
CE-1	Terminal sacrifice	93		normal
CE-2	Terminal sacrifice	93		normal
CE-3	Terminal sacrifice	93		normal
CE-4	Terminal sacrifice	93		normal
CE-5	Terminal sacrifice	93		normal
CE-6	Terminal sacrifice	92		normal
CE-7	Terminal sacrifice	92		normal
CE-8	Terminal sacrifice	92		normal
CE-9	Terminal sacrifice	92		normal
CE-10	Terminal sacrifice	92		normal
STUDY ID : GT14-00042	GROUP : Control			SEX : MALE
	DOSE : 0 mg/m ³			
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
LE-11	Terminal sacrifice	93		normal
LE-12	Terminal sacrifice	93		normal
LE-13	Terminal sacrifice	93		normal
LE-14	Terminal sacrifice	93		normal
LE-15	Terminal sacrifice	93		normal
LE-16	Terminal sacrifice	92		normal
LE-17	Terminal sacrifice	92		normal
LE-18	Terminal sacrifice	92		normal
LE-19	Terminal sacrifice	92		normal
LE-20	Terminal sacrifice	92		normal

Appendix 10-1. Individual gross findings of male rats in exposure group (continued)

INDIVIDUAL GROSS FINDINGS				
EXPOSURE 13WEEKS				
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
ME-21	Terminal sacrifice	93		normal
ME-22	Terminal sacrifice	93		normal
ME-23	Terminal sacrifice	93		normal
ME-24	Terminal sacrifice	93		normal
ME-25	Terminal sacrifice	93		normal
ME-26	Death	81	Abdominal cavity Urinary bladder	exudate, red dilatation, red urine in lumen
ME-27	Terminal sacrifice	92		normal
ME-28	Terminal sacrifice	92		normal
ME-29	Terminal sacrifice	92		normal
ME-30	Terminal sacrifice	92		normal
STUDY ID : GT14-00042	GROUP : Medium			SEX : MALE
	DOSE : 0.5 mg/m ³			
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
HE-31	Terminal sacrifice	93		normal
HE-32	Terminal sacrifice	93		normal
HE-33	Terminal sacrifice	93		normal
HE-34	Terminal sacrifice	93		normal
HE-35	Terminal sacrifice	93		normal
HE-36	Terminal sacrifice	92		normal
HE-37	Terminal sacrifice	92		normal
HE-38	Terminal sacrifice	92		normal
HE-39	Terminal sacrifice	92		normal
HE-40	Terminal sacrifice	92		normal

Appendix 10-2. Individual gross findings of female rats in exposure group

INDIVIDUAL GROSS FINDINGS				
EXPOSURE 13WEEKS				
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
CE-41	Terminal sacrifice	93		normal
CE-42	Terminal sacrifice	93		normal
CE-43	Terminal sacrifice	93		normal
CE-44	Terminal sacrifice	93		normal
CE-45	Terminal sacrifice	93		normal
CE-46	Terminal sacrifice	92		normal
CE-47	Terminal sacrifice	92		normal
CE-48	Terminal sacrifice	92		normal
CE-49	Terminal sacrifice	92		normal
CE-50	Terminal sacrifice	92		normal
<hr/>				
STUDY ID : GT14-00042	GROUP : Control			SEX : FEMALE
	DOSE : 0 mg/m ³			
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
LE-51	Terminal sacrifice	93		normal
LE-52	Terminal sacrifice	93		normal
LE-53	Terminal sacrifice	93		normal
LE-54	Terminal sacrifice	93		normal
LE-55	Terminal sacrifice	93		normal
LE-56	Terminal sacrifice	92		normal
LE-57	Terminal sacrifice	92		normal
LE-58	Terminal sacrifice	92		normal
LE-59	Terminal sacrifice	92		normal
LE-60	Terminal sacrifice	92		normal

Appendix 10-2. Individual gross findings of female rats in exposure group (continued)

INDIVIDUAL GROSS FINDINGS				
EXPOSURE 13WEEKS				
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
ME-61	Terminal sacrifice	93		normal
ME-62	Terminal sacrifice	93		normal
ME-63	Terminal sacrifice	93		normal
ME-64	Terminal sacrifice	93		normal
ME-65	Terminal sacrifice	93		normal
ME-66	Terminal sacrifice	92		normal
ME-67	Terminal sacrifice	92		normal
ME-68	Terminal sacrifice	92		normal
ME-69	Terminal sacrifice	92		normal
ME-70	Terminal sacrifice	92		normal
<hr/>				
STUDY ID : GT14-00042	GROUP : High			SEX : FEMALE
	DOSE : 1.0 mg/m ³			
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
HE-71	Terminal sacrifice	93		normal
HE-72	Terminal sacrifice	93		normal
HE-73	Terminal sacrifice	93		normal
HE-74	Terminal sacrifice	93		normal
HE-75	Terminal sacrifice	93		normal
HE-76	Terminal sacrifice	92		normal
HE-77	Terminal sacrifice	92		normal
HE-78	Terminal sacrifice	92		normal
HE-79	Terminal sacrifice	92		normal
HE-80	Terminal sacrifice	92		normal

Appendix 10-3. Individual gross findings of male rats in recovery group

INDIVIDUAL GROSS FINDINGS				
RECOVERY 13WEEKS				
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
CR-1	Terminal sacrifice	183		normal
CR-2	Terminal sacrifice	183		normal
CR-3	Terminal sacrifice	183		normal
CR-4	Terminal sacrifice	183		normal
CR-5	Terminal sacrifice	183		normal
STUDY ID : GT14-00042	GROUP : Control			SEX : MALE
				DOSE : 0 mg/m ³
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
LR-6	Terminal sacrifice	183		normal
LR-7	Terminal sacrifice	183		normal
LR-8	Terminal sacrifice	183		normal
LR-9	Terminal sacrifice	183		normal
LR-10	Terminal sacrifice	183	Testis (right) Epididymis(right)	small small

Appendix 10-3. Individual gross findings of male rats in recovery group (continued)

INDIVIDUAL GROSS FINDINGS				
RECOVERY 13WEEKS				
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
MR-11	Terminal sacrifice	183		normal
MR-12	Terminal sacrifice	183		normal
MR-13	Terminal sacrifice	183		normal
MR-14	Terminal sacrifice	183		normal
MR-15	Terminal sacrifice	183		normal
<hr/>				
STUDY ID : GT14-00042		GROUP : High		SEX : MALE
		DOSE : 1.0 mg/m ³		
ANIMAL	FATE	DAY	LOCATION	OBSERVATION
HR-16	Terminal sacrifice	183		normal
HR-17	Terminal sacrifice	183		normal
HR-18	Terminal sacrifice	183		normal
HR-19	Terminal sacrifice	183		normal
HR-20	Terminal sacrifice	183		normal

Appendix 11-1. Individual organ weights of male rats in exposure group

INDIVIDUAL ORGAN WEIGHTS EXPOSURE 13WEEKS											
STUDY ID : GT14-00042		GROUP : Control DOSE : 0 mg/m ³					SEX : MALE UNIT : g				
ANIMAL ID :		CE-1	CE-2	CE-3	CE-4	CE-5	CE-6	CE-7	CE-8	CE-9	CE-10
BODY WEIGHTS		256.53	278.47	300.93	278.76	293.27	281.04	280.59	269.73	265.50	263.93
TESTIS (LEFT)		1.3362	1.3994	1.5116	1.3943	1.4615	1.4153	1.4242	1.4081	1.3108	1.3220
% BODY WEIGHTS		0.5209	0.5025	0.5023	0.5002	0.4983	0.5036	0.5076	0.5220	0.4937	0.5009
TESTIS (RIGHT)		1.3651	1.3443	1.4249	1.4128	1.3684	1.3612	1.3518	1.3815	1.2648	1.3045
% BODY WEIGHTS		0.5321	0.4827	0.4735	0.5068	0.4666	0.4843	0.4818	0.5122	0.4764	0.4943
KIDNEY (LEFT)		0.7675	0.8645	0.9724	0.8462	0.8910	0.8976	0.8810	0.8115	0.8101	0.8497
% BODY WEIGHTS		0.2992	0.3104	0.3231	0.3036	0.3038	0.3194	0.3140	0.3009	0.3051	0.3219
KIDNEY (RIGHT)		0.7949	0.9180	0.9226	0.8211	0.8841	0.8912	0.8616	0.8312	0.7912	0.8617
% BODY WEIGHTS		0.3099	0.3297	0.3066	0.2946	0.3015	0.3171	0.3071	0.3082	0.2980	0.3265
SPLEEN		0.5433	0.6129	0.6169	0.5723	0.5993	0.5574	0.6142	0.5776	0.6328	0.5884
% BODY WEIGHTS		0.2118	0.2201	0.2050	0.2053	0.2044	0.1983	0.2189	0.2141	0.2383	0.2229
LIVER		6.9079	7.8015	8.1006	7.9972	8.5573	7.6523	7.1813	7.1877	7.2832	7.5754
% BODY WEIGHTS		2.6928	2.8016	2.6919	2.8688	2.9179	2.7229	2.5594	2.6648	2.7432	2.8702
ADRENAL GLAND (LEFT)		0.0368	0.0291	0.0283	0.0267	0.0207	0.0321	0.0240	0.0262	0.0367	0.0278
% BODY WEIGHTS		0.0143	0.0104	0.0094	0.0096	0.0071	0.0114	0.0086	0.0097	0.0138	0.0105
ADRENAL GLAND(RIGHT)		0.0318	0.0292	0.0227	0.0247	0.0191	0.0283	0.0242	0.0264	0.0325	0.0239
% BODY WEIGHTS		0.0124	0.0105	0.0075	0.0089	0.0065	0.0101	0.0086	0.0098	0.0122	0.0091
HEART		0.8066	0.8838	0.9421	0.8375	0.9013	0.8407	0.8917	0.7431	0.8165	0.8122
% BODY WEIGHTS		0.3144	0.3174	0.3131	0.3004	0.3073	0.2991	0.3178	0.2755	0.3075	0.3077
THYMUS		0.1573	0.1605	0.1801	0.1639	0.1592	0.1390	0.1478	0.1326	0.1286	0.1640
% BODY WEIGHTS		0.0613	0.0576	0.0598	0.0588	0.0543	0.0495	0.0527	0.0492	0.0484	0.0621
LUNG (LEFT)		-	-	-	-	-	0.3383	0.3327	0.3197	0.3263	0.3405
% BODY WEIGHTS		-	-	-	-	-	0.1204	0.1186	0.1185	0.1229	0.1290
LUNG (RIGHT)		-	-	-	-	-	0.6833	0.6182	0.5844	0.6057	0.6684
% BODY WEIGHTS		-	-	-	-	-	0.2431	0.2203	0.2167	0.2281	0.2532
BRAIN		1.8790	1.9157	1.9418	1.9076	1.9529	1.8888	1.8944	0.8996	0.8478	1.8927
% BODY WEIGHTS		0.7325	0.6879	0.6453	0.6843	0.6659	0.6721	0.6751	0.3335	0.3193	0.7171
OLFACCTORY BULB		0.0797	0.0722	0.1056	0.0977	0.0986	0.0872	0.0933	0.0966	0.0944	0.0845
% BODY WEIGHTS		0.0311	0.0259	0.0351	0.0350	0.0336	0.0310	0.0333	0.0358	0.0356	0.0320
PITUITARY GLAND		0.0068	0.0065	0.0076	0.0093	0.0081	0.0092	0.0082	0.0126	0.0070	0.0083
% BODY WEIGHTS		0.0027	0.0023	0.0025	0.0033	0.0028	0.0033	0.0029	0.0047	0.0026	0.0031

Appendix 11-1. Individual organ weights of male rats in exposure group (continued)

INDIVIDUAL ORGAN WEIGHTS EXPOSURE 13WEEKS										
STUDY ID : GT14-00042			GROUP : Low DOSE : 0.2 mg/m ³				SEX : MALE UNIT : g			
ANIMAL ID :	LE-11	LE-12	LE-13	LE-14	LE-15	LE-16	LE-17	LE-18	LE-19	LE-20
BODY WEIGHTS	258.20	264.83	301.99	272.46	304.26	268.42	271.61	292.28	296.26	287.01
TESTIS (LEFT)	1.4223	1.4096	1.4523	1.4006	1.4115	1.3331	1.4418	1.3840	1.4745	1.4276
% BODY WEIGHTS	0.5509	0.5323	0.4809	0.5141	0.4639	0.4966	0.5308	0.4735	0.4977	0.4974
TESTIS (RIGHT)	1.3934	1.3558	1.4388	1.4327	1.5033	1.3116	1.3797	1.4200	1.3323	1.4140
% BODY WEIGHTS	0.5397	0.5120	0.4764	0.5258	0.4941	0.4886	0.5080	0.4858	0.4497	0.4927
KIDNEY (LEFT)	0.8235	0.7948	0.9148	0.8534	0.8704	0.7824	0.8818	0.8761	0.9449	0.9209
% BODY WEIGHTS	0.3189	0.3001	0.3029	0.3132	0.2861	0.2915	0.3247	0.2997	0.3189	0.3209
KIDNEY (RIGHT)	0.7943	0.8033	0.9059	0.9369	0.9434	0.8262	0.8456	0.8467	0.9408	0.9376
% BODY WEIGHTS	0.3076	0.3033	0.3000	0.3439	0.3101	0.3078	0.3113	0.2897	0.3176	0.3267
SPLEEN	0.5385	0.6186	0.6399	0.6116	0.5973	0.5087	0.5874	0.6077	0.6018	0.5971
% BODY WEIGHTS	0.2086	0.2336	0.2119	0.2245	0.1963	0.1895	0.2163	0.2079	0.2031	0.2080
LIVER	7.1059	6.6566	8.3558	7.9315	8.2727	7.3922	7.3909	7.0490	7.9296	7.7728
% BODY WEIGHTS	2.7521	2.5135	2.7669	2.9111	2.7190	2.7540	2.7211	2.4117	2.6766	2.7082
ADRENAL GLAND (LEFT)	0.0273	0.0259	0.0240	0.0247	0.0232	0.0271	0.0281	0.0276	0.0384	0.0294
% BODY WEIGHTS	0.0106	0.0098	0.0079	0.0091	0.0076	0.0101	0.0103	0.0094	0.0130	0.0102
ADRENAL GLAND(RIGHT)	0.0199	0.0242	0.0213	0.0257	0.0226	0.0259	0.0240	0.0242	0.0306	0.0247
% BODY WEIGHTS	0.0077	0.0091	0.0071	0.0094	0.0074	0.0096	0.0088	0.0083	0.0103	0.0086
HEART	0.8227	0.9057	0.9141	0.8515	0.9103	0.7294	0.7957	0.8946	0.8928	0.9781
% BODY WEIGHTS	0.3186	0.3420	0.3027	0.3125	0.2992	0.2717	0.2930	0.3061	0.3014	0.3408
THYMUS	0.1400	0.1255	0.1783	0.1673	0.1532	0.1052	0.1581	0.1638	0.1672	0.1883
% BODY WEIGHTS	0.0542	0.0474	0.0590	0.0614	0.0504	0.0392	0.0582	0.0560	0.0564	0.0656
LUNG (LEFT)	-	-	-	-	-	0.3086	0.3409	0.3894	0.3910	0.4314
% BODY WEIGHTS	-	-	-	-	-	0.1150	0.1255	0.1332	0.1320	0.1503
LUNG (RIGHT)	-	-	-	-	-	0.5739	0.6485	0.6612	0.7560	0.7687
% BODY WEIGHTS	-	-	-	-	-	0.2138	0.2388	0.2262	0.2552	0.2678
BRAIN	1.9170	1.8778	1.9120	0.8942	1.8207	1.8528	1.9214	0.8954	1.9643	1.9084
% BODY WEIGHTS	0.7424	0.7091	0.6331	0.3282	0.5984	0.6903	0.7074	0.3064	0.6630	0.6649
OLFACTORY BULB	0.0936	0.0888	0.0814	0.0900	0.0918	0.0801	0.0697	0.0937	0.0888	0.0983
% BODY WEIGHTS	0.0363	0.0335	0.0270	0.0330	0.0302	0.0298	0.0257	0.0321	0.0300	0.0342
PITUITARY GLAND	0.0077	0.0079	0.0079	0.0103	0.0112	0.0093	0.0072	0.0084	0.0101	0.0067
% BODY WEIGHTS	0.0030	0.0030	0.0026	0.0038	0.0037	0.0035	0.0027	0.0029	0.0034	0.0023

Appendix 11-1. Individual organ weights of male rats in exposure group (continued)

INDIVIDUAL ORGAN WEIGHTS EXPOSURE 13WEEKS										
STUDY ID : GT14-00042			GROUP : Medium				SEX : MALE			
	DOSE : 0.5 mg/m ³									
ANIMAL ID :	ME-21	ME-22	ME-23	ME-24	ME-25	ME-26	ME-27	ME-28	ME-29	ME-30
BODY WEIGHTS	252.58	259.24	261.80	278.10	260.80	-	270.94	287.37	290.72	289.00
TESTIS (LEFT)	1.3528	1.3469	1.3753	1.3556	1.3684	-	1.4107	1.4414	1.4540	1.4999
% BODY WEIGHTS	0.5356	0.5196	0.5253	0.4875	0.5247	-	0.5207	0.5016	0.5001	0.5190
TESTIS (RIGHT)	1.3093	1.3368	1.3530	1.4320	1.3960	-	1.1538	1.3750	1.4184	1.4536
% BODY WEIGHTS	0.5184	0.5157	0.5168	0.5149	0.5353	-	0.4259	0.4785	0.4879	0.5030
KIDNEY (LEFT)	0.8361	0.8639	0.8177	0.8368	0.8239	-	0.8429	0.9191	0.9078	0.9318
% BODY WEIGHTS	0.3310	0.3332	0.3123	0.3009	0.3159	-	0.3111	0.3198	0.3123	0.3224
KIDNEY (RIGHT)	0.7954	0.8095	0.8438	0.8857	0.8236	-	0.8021	0.9089	0.9736	0.9538
% BODY WEIGHTS	0.3149	0.3123	0.3223	0.3185	0.3158	-	0.2960	0.3163	0.3349	0.3300
SPLEEN	0.5028	0.6178	0.5875	0.5931	0.5520	-	0.5094	0.6415	0.6190	0.6655
% BODY WEIGHTS	0.1991	0.2383	0.2244	0.2133	0.2117	-	0.1880	0.2232	0.2129	0.2303
LIVER	6.8548	6.9809	7.0839	7.9857	7.0861	-	7.3595	8.4719	8.1560	7.8260
% BODY WEIGHTS	2.7139	2.6928	2.7058	2.8715	2.7171	-	2.7163	2.9481	2.8054	2.7080
ADRENAL GLAND (LEFT)	0.0244	0.0330	0.0332	0.0312	0.0279	-	0.0259	0.0297	0.0290	0.0283
% BODY WEIGHTS	0.0097	0.0127	0.0127	0.0112	0.0107	-	0.0096	0.0103	0.0100	0.0098
ADRENAL GLAND(RIGHT)	0.0223	0.0314	0.0321	0.0272	0.0262	-	0.0253	0.0259	0.0271	0.0271
% BODY WEIGHTS	0.0088	0.0121	0.0123	0.0098	0.0100	-	0.0093	0.0090	0.0093	0.0094
HEART	0.7953	0.8344	0.8384	0.8865	0.7588	-	0.8471	0.8675	0.8819	0.8504
% BODY WEIGHTS	0.3149	0.3219	0.3202	0.3188	0.2910	-	0.3127	0.3019	0.3034	0.2943
THYMUS	0.1433	0.1248	0.1154	0.1662	0.1339	-	0.1291	0.1271	0.1583	0.1679
% BODY WEIGHTS	0.0567	0.0481	0.0441	0.0598	0.0513	-	0.0476	0.0442	0.0545	0.0581
LUNG (LEFT)	-	-	-	-	-	-	0.3164	0.3391	0.3739	0.3608
% BODY WEIGHTS	-	-	-	-	-	-	0.1168	0.1180	0.1286	0.1248
LUNG (RIGHT)	-	-	-	-	-	-	0.5974	0.6852	0.6370	0.6872
% BODY WEIGHTS	-	-	-	-	-	-	0.2205	0.2384	0.2191	0.2378
BRAIN	1.8403	1.8902	1.8248	1.9201	1.9329	-	1.9095	1.9206	1.9671	1.9161
% BODY WEIGHTS	0.7286	0.7291	0.6970	0.6904	0.7411	-	0.7048	0.6683	0.6766	0.6630
OLFACCTORY BULB	0.0952	0.0649	0.0918	0.0854	0.0847	-	0.0908	0.0734	0.0993	0.0906
% BODY WEIGHTS	0.0377	0.0250	0.0351	0.0307	0.0325	-	0.0335	0.0255	0.0342	0.0313
PITUITARY GLAND	0.0063	0.0068	0.0093	0.0063	0.0069	-	0.0103	0.0105	0.0086	0.0075
% BODY WEIGHTS	0.0025	0.0026	0.0036	0.0023	0.0026	-	0.0038	0.0037	0.0030	0.0026

Appendix 11-1. Individual organ weights of male rats in exposure group (continued)

INDIVIDUAL ORGAN WEIGHTS EXPOSURE 13WEEKS										
STUDY ID : GT14-00042			GROUP : High				SEX : MALE			
	DOSE : 1.0 mg/m ³						UNIT : g			
ANIMAL ID :	HE-31	HE-32	HE-33	HE-34	HE-35	HE-36	HE-37	HE-38	HE-39	HE-40
BODY WEIGHTS	242.38	283.40	267.04	254.58	289.29	300.74	294.95	299.00	282.27	277.35
TESTIS (LEFT) % BODY WEIGHTS	1.3456 0.5552	1.4199 0.5010	1.4617 0.5474	1.3833 0.5434	1.3479 0.4659	1.5014 0.4992	1.4125 0.4789	1.4616 0.4888	1.4179 0.5023	1.4704 0.5302
TESTIS (RIGHT) % BODY WEIGHTS	1.3116 0.5411	1.4061 0.4962	1.3751 0.5149	1.3017 0.5113	1.4311 0.4947	1.3032 0.4333	1.4245 0.4830	1.4161 0.4736	1.3775 0.4880	1.4380 0.5185
KIDNEY (LEFT) % BODY WEIGHTS	0.7482 0.3087	0.8729 0.3080	0.8103 0.3034	0.7855 0.3085	0.8390 0.2900	0.8901 0.2960	0.8420 0.2855	0.9477 0.3170	0.8683 0.3076	0.9026 0.3254
KIDNEY (RIGHT) % BODY WEIGHTS	0.7359 0.3036	0.8762 0.3092	0.8377 0.3137	0.8023 0.3151	0.8501 0.2939	0.9418 0.3132	0.8827 0.2993	0.9830 0.3288	0.8526 0.3021	0.9808 0.3536
SPLEEN % BODY WEIGHTS	0.4733 0.1953	0.6081 0.2146	0.5864 0.2196	0.5063 0.1989	0.6106 0.2111	0.6261 0.2082	0.5974 0.2025	0.5922 0.1981	0.6309 0.2235	0.6064 0.2186
LIVER % BODY WEIGHTS	6.6229 2.7324	7.8146 2.7574	7.3177 2.7403	6.9477 2.7291	7.9542 2.7496	8.2433 2.7410	7.5055 2.5447	7.8877 2.6380	7.7925 2.7607	7.2651 2.6195
ADRENAL GLAND (LEFT) % BODY WEIGHTS	0.0257 0.0106	0.0197 0.0070	0.0333 0.0125	0.0304 0.0119	0.0193 0.0067	0.0251 0.0083	0.0234 0.0079	0.0383 0.0128	0.0238 0.0084	0.0299 0.0108
ADRENAL GLAND(RIGHT) % BODY WEIGHTS	0.0269 0.0111	0.0239 0.0084	0.0303 0.0113	0.0250 0.0098	0.0191 0.0066	0.0201 0.0067	0.0230 0.0078	0.0321 0.0107	0.0230 0.0081	0.0251 0.0090
HEART % BODY WEIGHTS	0.8501 0.3507	0.8836 0.3118	0.8463 0.3169	0.8515 0.3345	0.8389 0.2900	0.7907 0.2629	0.7797 0.2643	0.8401 0.2810	0.7746 0.2744	0.7367 0.2656
THYMUS % BODY WEIGHTS	0.1221 0.0504	0.1523 0.0537	0.1610 0.0603	0.1124 0.0442	0.1719 0.0594	0.1685 0.0560	0.1663 0.0564	0.1348 0.0451	0.1578 0.0559	0.1530 0.0552
LUNG (LEFT) % BODY WEIGHTS	- -	- -	- -	- -	- -	0.3891 0.1294	0.3688 0.1250	0.3879 0.1297	0.3962 0.1404	0.4167 0.1502
LUNG (RIGHT) % BODY WEIGHTS	- -	- -	- -	- -	- -	0.6573 0.2186	0.6815 0.2311	0.7060 0.2361	0.7030 0.2491	0.7407 0.2671
BRAIN % BODY WEIGHTS	1.8826 0.7767	1.9022 0.6712	1.9757 0.7399	1.8863 0.7409	1.8694 0.6462	1.8832 0.6262	2.0066 0.6803	1.8785 0.6283	1.8764 0.6648	1.8936 0.6827
OLFACTORY BULB % BODY WEIGHTS	0.0780 0.0322	0.0920 0.0325	0.0746 0.0279	0.0792 0.0311	0.0944 0.0326	0.0853 0.0284	0.0904 0.0306	0.1004 0.0336	0.0832 0.0295	0.0784 0.0283
PITUITARY GLAND % BODY WEIGHTS	0.0109 0.0045	0.0084 0.0030	0.0075 0.0028	0.0065 0.0026	0.0065 0.0022	0.0119 0.0040	0.0104 0.0035	0.0081 0.0027	0.0044 0.0016	0.0077 0.0028

Appendix 11-2. Individual organ weights of female rats in exposure group

INDIVIDUAL ORGAN WEIGHTS EXPOSURE 13WEEKS											
STUDY ID : GT14-00042		GROUP : Control					SEX : FEMALE				
		DOSE : 0 mg/m ³					UNIT : g				
ANIMAL ID :		CE-41	CE-42	CE-43	CE-44	CE-45	CE-46	CE-47	CE-48	CE-49	CE-50
BODY WEIGHTS		152.83	150.95	165.15	144.58	170.05	154.21	153.53	156.53	144.93	169.96
OVARIUM (LEFT)		0.0289	0.0262	0.0326	0.0288	0.0339	0.0296	0.0284	0.0284	0.0309	0.0254
% BODY WEIGHTS		0.0189	0.0174	0.0197	0.0199	0.0199	0.0192	0.0185	0.0181	0.0213	0.0149
OVARIUM (RIGHT)		0.0195	0.0250	0.0295	0.0280	0.0295	0.0275	0.0248	0.0216	0.0250	0.0395
% BODY WEIGHTS		0.0128	0.0166	0.0179	0.0194	0.0173	0.0178	0.0162	0.0138	0.0172	0.0232
KIDNEY (LEFT)		0.5100	0.5682	0.5990	0.5930	0.5979	0.5653	0.5795	0.5821	0.5434	0.5366
% BODY WEIGHTS		0.3337	0.3764	0.3627	0.4102	0.3516	0.3666	0.3775	0.3719	0.3749	0.3157
KIDNEY (RIGHT)		0.5116	0.5386	0.5859	0.5667	0.6032	0.5603	0.5556	0.6162	0.5392	0.5742
% BODY WEIGHTS		0.3348	0.3568	0.3548	0.3920	0.3547	0.3633	0.3619	0.3937	0.3720	0.3378
SPLEEN		0.3279	0.3863	0.4043	0.3330	0.4201	0.3743	0.3673	0.3697	0.3799	0.3997
% BODY WEIGHTS		0.2146	0.2559	0.2448	0.2303	0.2470	0.2427	0.2392	0.2362	0.2621	0.2352
LIVER		4.1225	4.2808	4.2735	4.6134	4.7299	4.1478	4.1771	4.2451	3.7598	4.6362
% BODY WEIGHTS		2.6974	2.8359	2.5876	3.1909	2.7815	2.6897	2.7207	2.7120	2.5942	2.7278
ADRENAL GLAND (LEFT)		0.0283	0.0289	0.0252	0.0292	0.0309	0.0320	0.0336	0.0297	0.0270	0.0253
% BODY WEIGHTS		0.0185	0.0191	0.0153	0.0202	0.0182	0.0208	0.0219	0.0190	0.0186	0.0149
ADRENAL GLAND(RIGHT)		0.0274	0.0269	0.0289	0.0290	0.0244	0.0275	0.0289	0.0277	0.0238	0.0257
% BODY WEIGHTS		0.0179	0.0178	0.0175	0.0201	0.0143	0.0178	0.0188	0.0177	0.0164	0.0151
HEART		0.5788	0.5349	0.6011	0.6768	0.5516	0.5003	0.5393	0.5976	0.5505	0.6196
% BODY WEIGHTS		0.3787	0.3544	0.3640	0.4681	0.3244	0.3244	0.3513	0.3818	0.3798	0.3646
THYMUS		0.1147	0.1467	0.1775	0.1194	0.1744	0.1274	0.1324	0.1514	0.1524	0.1409
% BODY WEIGHTS		0.0751	0.0972	0.1075	0.0826	0.1026	0.0826	0.0862	0.0967	0.1052	0.0829
LUNG (LEFT)		-	-	-	-	-	0.2770	0.2564	0.2692	0.2877	0.2843
% BODY WEIGHTS		-	-	-	-	-	0.1796	0.1670	0.1720	0.1985	0.1673
LUNG (RIGHT)		-	-	-	-	-	0.5028	0.4801	0.5162	0.5032	0.5067
% BODY WEIGHTS		-	-	-	-	-	0.3260	0.3127	0.3298	0.3472	0.2981
BRAIN		1.7835	1.7322	1.8347	1.7333	1.7903	1.7609	1.7583	1.7788	1.7929	1.8053
% BODY WEIGHTS		1.1670	1.1475	1.1109	1.1989	1.0528	1.1419	1.1452	1.1364	1.2371	1.0622
OLFACCTORY BULB		0.0826	0.0789	0.0849	0.0868	0.0768	0.0864	0.0735	0.0948	0.0820	0.0890
% BODY WEIGHTS		0.0540	0.0523	0.0514	0.0600	0.0452	0.0560	0.0479	0.0606	0.0566	0.0524
PITUITARY GLAND		0.0142	0.0130	0.0117	0.0086	0.0162	0.0146	0.0122	0.0113	0.0120	0.0100
% BODY WEIGHTS		0.0093	0.0086	0.0071	0.0059	0.0095	0.0095	0.0079	0.0072	0.0083	0.0059

Appendix 11-2. Individual organ weights of female rats in exposure group (continued)

INDIVIDUAL ORGAN WEIGHTS EXPOSURE 13WEEKS											
STUDY ID : GT14-00042		GROUP : Low DOSE : 0.2 mg/m ³					SEX : FEMALE UNIT : g				
ANIMAL ID :		LE-51	LE-52	LE-53	LE-54	LE-55	LE-56	LE-57	LE-58	LE-59	LE-60
BODY WEIGHTS		139.30	147.62	169.99	138.98	159.03	178.50	154.96	171.19	174.67	176.96
OVARIUM (LEFT)		0.0526	0.0244	0.0305	0.0280	0.0219	0.0322	0.0229	0.0240	0.0274	0.0254
% BODY WEIGHTS		0.0378	0.0165	0.0179	0.0201	0.0138	0.0180	0.0148	0.0140	0.0157	0.0144
OVARIUM (RIGHT)		0.0475	0.0270	0.0299	0.0168	0.0237	0.0315	0.0225	0.0280	0.0287	0.0280
% BODY WEIGHTS		0.0341	0.0183	0.0176	0.0121	0.0149	0.0176	0.0145	0.0164	0.0164	0.0158
KIDNEY (LEFT)		0.5174	0.5243	0.6009	0.5043	0.5477	0.6393	0.5902	0.5867	0.6397	0.6192
% BODY WEIGHTS		0.3714	0.3552	0.3535	0.3629	0.3444	0.3582	0.3809	0.3427	0.3662	0.3499
KIDNEY (RIGHT)		0.5006	0.5470	0.6189	0.4959	0.5451	0.5923	0.5701	0.5862	0.6242	0.6196
% BODY WEIGHTS		0.3594	0.3705	0.3641	0.3568	0.3428	0.3318	0.3679	0.3424	0.3574	0.3501
SPLEEN		0.3489	0.3361	0.4181	0.3650	0.4468	0.4437	0.3401	0.4631	0.4124	0.3950
% BODY WEIGHTS		0.2505	0.2277	0.2460	0.2626	0.2810	0.2486	0.2195	0.2705	0.2361	0.2232
LIVER		3.8241	4.0684	4.4114	3.5874	3.7860	4.7569	3.8007	4.2833	5.0926	4.7872
% BODY WEIGHTS		2.7452	2.7560	2.5951	2.5812	2.3807	2.6649	2.4527	2.5021	2.9156	2.7052
ADRENAL GLAND (LEFT)		0.0306	0.0272	0.0292	0.0214	0.0227	0.0370	0.0231	0.0302	0.0326	0.0265
% BODY WEIGHTS		0.0220	0.0184	0.0172	0.0154	0.0143	0.0207	0.0149	0.0176	0.0187	0.0150
ADRENAL GLAND(RIGHT)		0.0244	0.0276	0.0294	0.0227	0.0196	0.0326	0.0206	0.0294	0.0298	0.0261
% BODY WEIGHTS		0.0175	0.0187	0.0173	0.0163	0.0123	0.0183	0.0133	0.0172	0.0171	0.0147
HEART		0.4665	0.6077	0.5813	0.5670	0.5624	0.5391	0.5115	0.6220	0.6080	0.5687
% BODY WEIGHTS		0.3349	0.4117	0.3420	0.4080	0.3536	0.3020	0.3301	0.3633	0.3481	0.3214
THYMUS		0.1399	0.1363	0.1723	0.1022	0.1523	0.1312	0.1405	0.1589	0.1572	0.1479
% BODY WEIGHTS		0.1004	0.0923	0.1014	0.0735	0.0958	0.0735	0.0907	0.0928	0.0900	0.0836
LUNG (LEFT)		-	-	-	-	-	0.2955	0.2699	0.2849	0.2771	0.2950
% BODY WEIGHTS		-	-	-	-	-	0.1655	0.1742	0.1664	0.1586	0.1667
LUNG (RIGHT)		-	-	-	-	-	0.4959	0.4835	0.5138	0.5162	0.5164
% BODY WEIGHTS		-	-	-	-	-	0.2778	0.3120	0.3001	0.2955	0.2918
BRAIN		1.7060	1.8000	1.8191	1.7597	1.7664	1.8205	0.7609	1.7945	1.8090	1.7504
% BODY WEIGHTS		1.2247	1.2193	1.0701	1.2662	1.1107	1.0199	0.4910	1.0483	1.0357	0.9892
OLFACCTORY BULB		0.0741	0.0915	0.0843	0.0795	0.0778	0.0590	0.0658	0.0946	0.0722	0.0808
% BODY WEIGHTS		0.0532	0.0620	0.0496	0.0572	0.0489	0.0331	0.0425	0.0553	0.0413	0.0457
PITUITARY GLAND		0.0130	0.0130	0.0132	0.0095	0.0100	0.0116	0.0109	0.0136	0.0174	0.0138
% BODY WEIGHTS		0.0093	0.0088	0.0078	0.0068	0.0063	0.0065	0.0070	0.0079	0.0100	0.0078

Appendix 11-2. Individual organ weights of female rats in exposure group (continued)

INDIVIDUAL ORGAN WEIGHTS EXPOSURE 13WEEKS											
STUDY ID : GT14-00042		GROUP : Medium DOSE : 0.5 mg/m ³					SEX : FEMALE UNIT : g				
ANIMAL ID :		ME-61	ME-62	ME-63	ME-64	ME-65	ME-66	ME-67	ME-68	ME-69	ME-70
BODY WEIGHTS		145.83	143.88	151.71	173.81	168.05	156.08	157.80	166.87	168.84	173.40
OVARIUM (LEFT)		0.0263	0.0288	0.0298	0.0313	0.0280	0.0203	0.0253	0.0415	0.0242	0.0307
% BODY WEIGHTS		0.0180	0.0200	0.0196	0.0180	0.0167	0.0130	0.0160	0.0249	0.0143	0.0177
OVARIUM (RIGHT)		0.0224	0.0260	0.0346	0.0321	0.0363	0.0325	0.0227	0.0297	0.0310	0.0286
% BODY WEIGHTS		0.0154	0.0181	0.0228	0.0185	0.0216	0.0208	0.0144	0.0178	0.0184	0.0165
KIDNEY (LEFT)		0.5321	0.5297	0.5252	0.5951	0.5291	0.5535	0.5864	0.6249	0.5800	0.6375
% BODY WEIGHTS		0.3649	0.3682	0.3462	0.3424	0.3148	0.3546	0.3716	0.3745	0.3435	0.3676
KIDNEY (RIGHT)		0.5305	0.5293	0.5629	0.5831	0.5762	0.5405	0.5774	0.6099	0.5964	0.5898
% BODY WEIGHTS		0.3638	0.3679	0.3710	0.3355	0.3429	0.3463	0.3659	0.3655	0.3532	0.3401
SPLEEN		0.3659	0.3704	0.3966	0.3876	0.3747	0.3386	0.3597	0.4488	0.3775	0.4334
% BODY WEIGHTS		0.2509	0.2574	0.2614	0.2230	0.2230	0.2169	0.2279	0.2690	0.2236	0.2499
LIVER		3.8471	3.8050	3.3824	4.4679	4.8247	4.1811	4.1941	4.6698	4.4886	4.8551
% BODY WEIGHTS		2.6381	2.6446	2.2295	2.5706	2.8710	2.6788	2.6579	2.7985	2.6585	2.7999
ADRENAL GLAND (LEFT)		0.0294	0.0337	0.0278	0.0298	0.0308	0.0303	0.0333	0.0359	0.0262	0.0284
% BODY WEIGHTS		0.0202	0.0234	0.0183	0.0171	0.0183	0.0194	0.0211	0.0215	0.0155	0.0164
ADRENAL GLAND(RIGHT)		0.0364	0.0282	0.0276	0.0247	0.0277	0.0277	0.0341	0.0294	0.0253	0.0244
% BODY WEIGHTS		0.0250	0.0196	0.0182	0.0142	0.0165	0.0177	0.0216	0.0176	0.0150	0.0141
HEART		0.5121	0.5169	0.5365	0.6073	0.5971	0.5800	0.5312	0.6237	0.5755	0.7183
% BODY WEIGHTS		0.3512	0.3593	0.3536	0.3494	0.3553	0.3716	0.3366	0.3738	0.3409	0.4142
THYMUS		0.1455	0.1167	0.1445	0.1316	0.1740	0.1394	0.1115	0.1416	0.1557	0.1640
% BODY WEIGHTS		0.0998	0.0811	0.0952	0.0757	0.1035	0.0893	0.0707	0.0849	0.0922	0.0946
LUNG (LEFT)		-	-	-	-	-	0.2553	0.2370	0.3025	0.2648	0.2834
% BODY WEIGHTS		-	-	-	-	-	0.1636	0.1502	0.1813	0.1568	0.1634
LUNG (RIGHT)		-	-	-	-	-	0.4743	0.4864	0.5412	0.4781	0.5254
% BODY WEIGHTS		-	-	-	-	-	0.3039	0.3082	0.3243	0.2832	0.3030
BRAIN		1.7664	1.7307	1.8549	1.8006	1.8012	1.7906	1.7814	1.7544	1.7889	1.7500
% BODY WEIGHTS		1.2113	1.2029	1.2227	1.0360	1.0718	1.1472	1.1289	1.0514	1.0595	1.0092
OLFACTORY BULB		0.0879	0.0705	0.0901	0.0803	0.0861	0.0897	0.0509	0.0698	0.0689	0.0923
% BODY WEIGHTS		0.0603	0.0490	0.0594	0.0462	0.0512	0.0575	0.0323	0.0418	0.0408	0.0532
PITUITARY GLAND		0.0132	0.0143	0.0139	0.0119	0.0174	0.0105	0.0108	0.0182	0.0102	0.0115
% BODY WEIGHTS		0.0091	0.0099	0.0092	0.0068	0.0104	0.0067	0.0068	0.0109	0.0060	0.0066

Appendix 11-2. Individual organ weights of female rats in exposure group (continued)

INDIVIDUAL ORGAN WEIGHTS EXPOSURE 13WEEKS											
STUDY ID : GT14-00042		GROUP : High DOSE : 1.0 mg/m ³				SEX : FEMALE UNIT : g					
ANIMAL ID :		HE-71	HE-72	HE-73	HE-74	HE-75	HE-76	HE-77	HE-78	HE-79	HE-80
BODY WEIGHTS		153.64	161.72	170.41	151.76	153.27	150.65	177.14	161.04	170.68	151.74
OVARIUM (LEFT)		0.0381	0.0402	0.0442	0.0342	0.0313	0.0304	0.0241	0.0225	0.0195	0.0201
% BODY WEIGHTS		0.0248	0.0249	0.0259	0.0225	0.0204	0.0202	0.0136	0.0140	0.0114	0.0132
OVARIUM (RIGHT)		0.0256	0.0227	0.0500	0.0347	0.0332	0.0223	0.0280	0.0308	0.0387	0.0291
% BODY WEIGHTS		0.0167	0.0140	0.0293	0.0229	0.0217	0.0148	0.0158	0.0191	0.0227	0.0192
KIDNEY (LEFT)		0.5681	0.5543	0.6129	0.5547	0.4973	0.5776	0.5791	0.5884	0.5698	0.5372
% BODY WEIGHTS		0.3698	0.3428	0.3597	0.3655	0.3245	0.3834	0.3269	0.3654	0.3338	0.3540
KIDNEY (RIGHT)		0.5102	0.5564	0.6093	0.5285	0.5134	0.5644	0.6023	0.5944	0.5589	0.5490
% BODY WEIGHTS		0.3321	0.3441	0.3575	0.3482	0.3350	0.3746	0.3400	0.3691	0.3275	0.3618
SPLEEN		0.3321	0.3754	0.4257	0.3967	0.3475	0.3583	0.4402	0.4330	0.4247	0.3577
% BODY WEIGHTS		0.2162	0.2321	0.2498	0.2614	0.2267	0.2378	0.2485	0.2689	0.2488	0.2357
LIVER		4.0492	4.2043	4.6470	4.0184	3.9779	4.1389	4.5268	4.4896	4.6223	4.0003
% BODY WEIGHTS		2.6355	2.5997	2.7270	2.6479	2.5954	2.7474	2.5555	2.7879	2.7082	2.6363
ADRENAL GLAND (LEFT)		0.0226	0.0296	0.0279	0.0274	0.0244	0.0282	0.0230	0.0297	0.0275	0.0294
% BODY WEIGHTS		0.0147	0.0183	0.0164	0.0181	0.0159	0.0187	0.0130	0.0184	0.0161	0.0194
ADRENAL GLAND(RIGHT)		0.0247	0.0321	0.0278	0.0243	0.0279	0.0261	0.0281	0.0254	0.0297	0.0261
% BODY WEIGHTS		0.0161	0.0198	0.0163	0.0160	0.0182	0.0173	0.0159	0.0158	0.0174	0.0172
HEART		0.5962	0.6001	0.5823	0.5533	0.5187	0.5346	0.5456	0.5420	0.5806	0.5715
% BODY WEIGHTS		0.3880	0.3711	0.3417	0.3646	0.3384	0.3549	0.3080	0.3366	0.3402	0.3766
THYMUS		0.1413	0.1053	0.1552	0.1330	0.1193	0.1162	0.1996	0.1460	0.1556	0.1349
% BODY WEIGHTS		0.0920	0.0651	0.0911	0.0876	0.0778	0.0771	0.1127	0.0907	0.0912	0.0889
LUNG (LEFT)		-	-	-	-	-	0.2479	0.3009	0.2920	0.2753	0.2451
% BODY WEIGHTS		-	-	-	-	-	0.1646	0.1699	0.1813	0.1613	0.1615
LUNG (RIGHT)		-	-	-	-	-	0.4696	0.5563	0.5273	0.5150	0.4848
% BODY WEIGHTS		-	-	-	-	-	0.3117	0.3140	0.3274	0.3017	0.3195
BRAIN		1.7129	1.7734	1.8162	1.7513	1.7814	1.7968	1.8496	1.8071	1.7481	1.7427
% BODY WEIGHTS		1.1149	1.0966	1.0658	1.1540	1.1623	1.1927	1.0441	1.1221	1.0242	1.1485
OLFACCTORY BULB		0.0799	0.0801	0.0927	0.0725	0.0873	0.0825	0.0838	0.0713	0.0970	0.0849
% BODY WEIGHTS		0.0520	0.0495	0.0544	0.0478	0.0570	0.0548	0.0473	0.0443	0.0568	0.0560
PITUITARY GLAND		0.0085	0.0129	0.0130	0.0112	0.0114	0.0132	0.0078	0.0144	0.0140	0.0095
% BODY WEIGHTS		0.0055	0.0080	0.0076	0.0074	0.0074	0.0088	0.0044	0.0089	0.0082	0.0063

Appendix 11-3. Individual organ weights of male rats in recovery group

INDIVIDUAL ORGAN WEIGHTS RECOVERY 13WEEKS					
STUDY ID : GT14-00042		GROUP : Control		SEX : MALE	
		DOSE : 0 mg/m ³		UNIT : g	
ANIMAL ID :		CR-1	CR-2	CR-3	CR-5
BODY WEIGHTS		350.65	348.41	357.25	360.80
TESTIS (LEFT)		1.5399	1.4865	1.5875	1.4609
% BODY WEIGHTS		0.4392	0.4267	0.4444	0.4049
TESTIS (RIGHT)		1.4115	1.5044	1.5598	1.5557
% BODY WEIGHTS		0.4025	0.4318	0.4366	0.4312
KIDNEY (LEFT)		1.0483	1.0082	1.0564	1.0466
% BODY WEIGHTS		0.2990	0.2894	0.2957	0.2901
KIDNEY (RIGHT)		0.9970	1.0817	1.0983	1.0273
% BODY WEIGHTS		0.2843	0.3105	0.3074	0.2847
SPLEEN		0.7395	0.6910	0.8047	0.6980
% BODY WEIGHTS		0.2109	0.1983	0.2252	0.1935
LIVER		10.2783	9.8762	10.2450	10.2232
% BODY WEIGHTS		2.9312	2.8346	2.8677	2.8335
ADRENAL GLAND (LEFT)		0.0261	0.0239	0.0270	0.0258
% BODY WEIGHTS		0.0074	0.0069	0.0076	0.0072
ADRENAL GLAND(RIGHT)		0.0291	0.0226	0.0239	0.0265
% BODY WEIGHTS		0.0083	0.0065	0.0067	0.0073
HEART		0.9362	1.0371	0.9889	1.0652
% BODY WEIGHTS		0.2670	0.2977	0.2768	0.2952
THYMUS		0.1385	0.1113	0.1010	0.1115
% BODY WEIGHTS		0.0395	0.0319	0.0283	0.0309
LUNG (LEFT)		0.3989	0.3887	0.4064	0.4299
% BODY WEIGHTS		0.1138	0.1116	0.1138	0.1192
BRAIN		1.9493	2.0420	2.0129	1.9982
% BODY WEIGHTS		0.5559	0.5861	0.5634	0.5538
OLFACCTORY BULB		0.1016	0.0995	0.0920	0.0872
% BODY WEIGHTS		0.0290	0.0286	0.0258	0.0242
PITUITARY GLAND		0.0096	0.0090	0.0088	0.0098
% BODY WEIGHTS		0.0027	0.0026	0.0025	0.0027

Appendix 11-3. Individual organ weights of male rats in recovery group (continued)

INDIVIDUAL ORGAN WEIGHTS					
RECOVERY 13WEEKS					
STUDY ID : GT14-00042		GROUP : Low		SEX : MALE	
		DOSE : 0.2 mg/m ³		UNIT : g	
ANIMAL ID :		LR-6	LR-7	LR-8	LR-10
BODY WEIGHTS		350.58	345.72	373.82	361.70
TESTIS (LEFT)		1.5465	1.5166	1.5799	1.5274
% BODY WEIGHTS		0.4411	0.4387	0.4226	0.4223
TESTIS (RIGHT)		1.4459	1.4434	1.5620	1.4983
% BODY WEIGHTS		0.4124	0.4175	0.4178	0.4142
KIDNEY (LEFT)		1.0578	0.9788	1.0848	1.0654
% BODY WEIGHTS		0.3017	0.2831	0.2902	0.2946
KIDNEY (RIGHT)		1.0345	0.9776	1.1254	1.0686
% BODY WEIGHTS		0.2951	0.2828	0.3011	0.2954
SPLEEN		0.8082	0.7080	0.7805	0.7760
% BODY WEIGHTS		0.2305	0.2048	0.2088	0.2145
LIVER		10.0206	9.9486	10.7431	9.8781
% BODY WEIGHTS		2.8583	2.8776	2.8739	2.7310
ADRENAL GLAND (LEFT)		0.0237	0.0257	0.0293	0.0248
% BODY WEIGHTS		0.0068	0.0074	0.0078	0.0069
ADRENAL GLAND(RIGHT)		0.0219	0.0203	0.0242	0.0226
% BODY WEIGHTS		0.0062	0.0059	0.0065	0.0062
HEART		1.0002	0.8981	1.0606	1.0098
% BODY WEIGHTS		0.2853	0.2598	0.2837	0.2792
THYMUS		0.1153	0.1155	0.1251	0.1045
% BODY WEIGHTS		0.0329	0.0334	0.0335	0.0289
LUNG (LEFT)		0.4177	0.4510	0.4514	0.3978
% BODY WEIGHTS		0.1191	0.1305	0.1208	0.1100
BRAIN		1.9556	1.9268	2.0462	2.0083
% BODY WEIGHTS		0.5578	0.5573	0.5474	0.5552
OLFACTORY BULB		0.0964	0.0930	0.0854	0.0575
% BODY WEIGHTS		0.0275	0.0269	0.0228	0.0159
PITUITARY GLAND		0.0083	0.0089	0.0099	0.0092
% BODY WEIGHTS		0.0024	0.0026	0.0026	0.0025

Appendix 11-3. Individual organ weights of male rats in recovery group (continued)

INDIVIDUAL ORGAN WEIGHTS					
RECOVERY 13WEEKS					
STUDY ID : GT14-00042		GROUP : Medium		SEX : MALE	
		DOSE : 0.5 mg/m ³		UNIT : g	
ANIMAL ID :	MR-11	MR-12	MR-13	MR-14	MR-15
BODY WEIGHTS	321.10	309.61	364.48	379.02	352.45
TESTIS (LEFT)	1.5568	1.4784	1.4297	1.4407	1.5230
% BODY WEIGHTS	0.4848	0.4775	0.3923	0.3801	0.4321
TESTIS (RIGHT)	1.4906	1.4528	1.4607	1.5457	1.4792
% BODY WEIGHTS	0.4642	0.4692	0.4008	0.4078	0.4197
KIDNEY (LEFT)	0.9822	0.9694	1.0852	1.0750	1.0443
% BODY WEIGHTS	0.3059	0.3131	0.2977	0.2836	0.2963
KIDNEY (RIGHT)	1.0349	0.9773	1.0657	1.1500	1.0902
% BODY WEIGHTS	0.3223	0.3157	0.2924	0.3034	0.3093
SPLEEN	0.6096	0.6443	0.7215	0.8573	0.7443
% BODY WEIGHTS	0.1898	0.2081	0.1980	0.2262	0.2112
LIVER	8.4640	8.6573	9.9632	10.9631	9.9545
% BODY WEIGHTS	2.6359	2.7962	2.7335	2.8925	2.8244
ADRENAL GLAND (LEFT)	0.0307	0.0214	0.0234	0.0254	0.0270
% BODY WEIGHTS	0.0096	0.0069	0.0064	0.0067	0.0077
ADRENAL GLAND(RIGHT)	0.0324	0.0205	0.0218	0.0249	0.0255
% BODY WEIGHTS	0.0101	0.0066	0.0060	0.0066	0.0072
HEART	0.9502	0.8922	1.1088	1.1135	1.0009
% BODY WEIGHTS	0.2959	0.2882	0.3042	0.2938	0.2840
THYMUS	0.0990	0.1052	0.1196	0.1057	0.1276
% BODY WEIGHTS	0.0308	0.0340	0.0328	0.0279	0.0362
LUNG (LEFT)	0.3788	0.4198	0.4232	0.4961	0.4631
% BODY WEIGHTS	0.1180	0.1356	0.1161	0.1309	0.1314
BRAIN	2.0092	2.0254	1.9381	2.0365	2.0069
% BODY WEIGHTS	0.6257	0.6542	0.5317	0.5373	0.5694
OLFACTORY BULB	0.0807	0.1004	0.0628	0.0986	0.0901
% BODY WEIGHTS	0.0251	0.0324	0.0172	0.0260	0.0256
PITUITARY GLAND	0.0125	0.0081	0.0096	0.0069	0.0101
% BODY WEIGHTS	0.0039	0.0026	0.0026	0.0018	0.0029

Appendix 11-3. Individual organ weights of male rats in recovery group (continued)

INDIVIDUAL ORGAN WEIGHTS					
RECOVERY 13WEEKS					
STUDY ID : GT14-00042		GROUP : High		SEX : MALE	
		DOSE : 1.0 mg/m ³		UNIT : g	
ANIMAL ID :		HR-16	HR-17	HR-18	HR-19
BODY WEIGHTS		335.22	342.69	367.90	335.54
TESTIS (LEFT)		1.5257	1.4904	1.5773	1.5147
% BODY WEIGHTS		0.4551	0.4349	0.4287	0.4514
TESTIS (RIGHT)		1.4558	1.4725	1.4639	1.3808
% BODY WEIGHTS		0.4343	0.4297	0.3979	0.4115
KIDNEY (LEFT)		1.0300	1.0497	1.0732	0.9730
% BODY WEIGHTS		0.3073	0.3063	0.2917	0.2900
KIDNEY (RIGHT)		1.0336	1.0130	1.0692	1.0278
% BODY WEIGHTS		0.3083	0.2956	0.2906	0.3063
SPLEEN		0.6993	0.6644	0.7637	0.6824
% BODY WEIGHTS		0.2086	0.1939	0.2076	0.2034
LIVER		10.1409	10.2485	11.1120	9.8300
% BODY WEIGHTS		3.0251	2.9906	3.0204	2.9296
ADRENAL GLAND (LEFT)		0.0295	0.0290	0.0276	0.0265
% BODY WEIGHTS		0.0088	0.0085	0.0075	0.0079
ADRENAL GLAND(RIGHT)		0.0216	0.0275	0.0248	0.0260
% BODY WEIGHTS		0.0064	0.0080	0.0067	0.0077
HEART		0.9447	0.9647	0.9774	0.9059
% BODY WEIGHTS		0.2818	0.2815	0.2657	0.2700
THYMUS		0.1151	0.1125	0.1398	0.1233
% BODY WEIGHTS		0.0343	0.0328	0.0380	0.0367
LUNG (LEFT)		0.3903	0.3842	0.4146	0.3715
% BODY WEIGHTS		0.1164	0.1121	0.1127	0.1107
BRAIN		1.9753	1.9700	1.9313	1.9625
% BODY WEIGHTS		0.5893	0.5749	0.5250	0.5849
OLFACTORY BULB		0.0944	0.0955	0.0654	0.0897
% BODY WEIGHTS		0.0282	0.0279	0.0178	0.0267
PITUITARY GLAND		0.0118	0.0090	0.0093	0.0087
% BODY WEIGHTS		0.0035	0.0026	0.0025	0.0026

Appendix 12-1. Individual biochemistry test of male rats in exposure group

INDIVIDUAL BIOCHEMISTRY TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Control					SEX : MALE			
DOSE : 0 mg/m ³												
ANIMAL ID	ALB ¹ g/dl	ALP ² IU/ℓ	CA ³ mg/dl	CHO ⁴ mg/dl	CRE ⁵ mg/dl	GGT ⁶ IU/ℓ	GLU ⁷ mg/dl	AST ⁸ mg/dl	ALT ⁹ IU/ℓ	IP ¹⁰ mg/dl	LDH ¹¹ IU/ℓ	MG ¹² mg/dl
CE-1	2.8	454	9.2	76	0.68	1	174	134	53	5.2	1382	2.2
CE-2	2.9	361	9.6	82	0.51	1	168	106	51	6.2	669	2.0
CE-3	2.8	388	9.3	68	0.51	1	176	112	55	6.3	574	1.9
CE-4	2.7	324	9.5	77	0.53	1	201	120	58	5.7	694	2.0
CE-5	2.8	329	8.5	78	0.43	0	189	149	70	5.5	754	2.1
CE-6	3.0	505	10.1	79	0.69	0	168	134	67	6.0	824	2.1
CE-7	2.6	373	9.8	74	0.55	0	183	108	49	6.6	662	2.0
CE-8	3.0	436	10.0	91	0.50	0	174	122	65	6.3	546	2.1
CE-9	2.8	309	6.9	85	0.54	1	174	117	65	5.4	865	2.2
CE-10	3.0	325	9.4	85	0.46	0	169	146	70	4.9	581	2.1
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	TP ¹³ g/dl	UA ¹⁴ mg/dl	BUN ¹⁵ mg/dl	TBIL ¹⁶ mg/dl	TG ¹⁷ mg/dl	CK ¹⁸ IU/ℓ	Na ¹⁹ mmol/ℓ	K ²⁰ mmol/ℓ	Cl ²¹ mmol/ℓ	A/L ²²		
CE-1	6.3	1.3	20.6	0.01	50	980	133	3.7	112	0.80		
CE-2	6.3	0.8	21.8	0.00	84	498	142	3.8	106	0.85		
CE-3	6.3	0.7	22.0	0.00	70	412	141	3.8	104	0.80		
CE-4	6.2	0.9	20.1	0.02	144	689	141	4.0	103	0.77		
CE-5	6.4	0.8	21.5	0.00	147	694	142	4.0	103	0.78		
CE-6	6.8	1.5	28.9	0.01	34	830	140	4.1	107	0.79		
CE-7	6.1	1.0	23.9	0.00	26	1314	145	4.1	107	0.74		
CE-8	6.6	0.7	23.1	0.02	63	555	145	3.9	106	0.83		
CE-9	6.7	1.1	23.2	0.05	102	808	144	4.1	104	0.72		
CE-10	6.5	0.8	22.2	0.04	102	600	143	3.9	104	0.86		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-1. Individual biochemistry test of male rats in exposure group (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Low					SEX : MALE			
DOSE : 0.2 mg/m ³												
ANIMAL ID	ALB ¹ g/dl	ALP ² IU/ l	CA ³ mg/dl	CHO ⁴ mg/dl	CRE ⁵ mg/dl	GGT ⁶ IU/ l	GLU ⁷ mg/dl	AST ⁸ mg/dl	ALT ⁹ IU/ l	IP ¹⁰ mg/dl	LDH ¹¹ IU/ l	MG ¹² mg/dl
LE-11	2.7	385	9.0	64	0.56	0	154	141	58	5.9	1374	2.3
LE-12	2.7	413	9.3	69	0.51	1	144	129	59	7.9	766	2.2
LE-13	2.8	368	9.6	75	0.47	1	185	119	58	5.7	910	2.0
LE-14	2.8	386	9.4	70	0.58	1	160	120	57	6.2	962	2.1
LE-15	2.8	332	9.8	80	0.69	1	183	110	59	6.4	734	2.1
LE-16	2.9	546	9.7	72	0.73	0	180	154	76	7.4	1156	2.4
LE-17	2.8	434	9.8	67	0.65	0	178	130	61	7.1	766	2.3
LE-18	2.8	421	10.1	74	0.51	0	173	102	60	6.8	558	2.0
LE-19	2.8	368	10.1	92	0.58	0	208	100	52	5.8	675	2.0
LE-20	2.8	372	10.1	80	0.49	0	178	130	69	5.1	470	2.1
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	TP ¹³ g/dl	UA ¹⁴ mg/dl	BUN ¹⁵ mg/dl	TBIL ¹⁶ mg/dl	TG ¹⁷ IU/ l	CK ¹⁸ mmol/ l	Na ¹⁹ mmol/ l	K ²⁰ mmol/ l	Cl ²¹ mmol/ l	A/L ²²		
LE-11	6.2	1.1	23.6	0.00	46	1085	143	3.8	104	0.77		
LE-12	6.1	1.2	23.1	0.00	38	907	144	4.0	104	0.79		
LE-13	6.3	1.0	20.7	0.03	109	1012	140	4.0	102	0.80		
LE-14	6.4	1.1	22.4	0.02	147	900	141	4.1	102	0.78		
LE-15	6.5	1.1	21.2	0.02	159	745	142	4.0	101	0.76		
LE-16	6.6	1.4	30.4	0.00	36	1008	146	4.0	101	0.78		
LE-17	6.3	1.3	26.1	0.00	46	1521	146	4.0	104	0.80		
LE-18	6.3	1.0	27.9	0.01	32	703	144	4.2	103	0.80		
LE-19	6.3	1.1	22.9	0.02	113	784	143	4.2	102	0.80		
LE-20	6.4	0.8	24.1	0.02	91	440	145	4.0	105	0.78		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-1. Individual biochemistry test of male rats in exposure group (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Medium					SEX : MALE			
DOSE : 0.5 mg/m ³												
ANIMAL ID	ALB ¹ g/dl	ALP ² IU/ l	CA ³ mg/dl	CHO ⁴ mg/dl	CRE ⁵ mg/dl	GGT ⁶ IU/ l	GLU ⁷ mg/dl	AST ⁸ mg/dl	ALT ⁹ IU/ l	IP ¹⁰ mg/dl	LDH ¹¹ IU/ l	MG ¹² mg/dl
ME-21	2.8	384	9.2	72	0.56	1	171	136	56	5.5	975	2.1
ME-22	2.7	407	9.3	57	0.66	1	170	137	61	8.3	851	2.2
ME-23	2.8	353	9.5	69	0.53	1	163	137	63	5.8	1033	2.0
ME-24	2.8	371	9.8	71	0.54	1	176	116	58	5.5	721	1.9
ME-25	2.8	408	9.7	74	0.57	1	185	106	57	5.2	423	2.0
ME-26	-	-	-	-	-	-	-	-	-	-	-	-
ME-27	2.9	470	9.5	81	0.76	0	182	118	57	6.8	1210	2.3
ME-28	2.9	355	10.0	94	0.56	0	193	124	60	5.1	349	2.2
ME-29	2.9	351	10.1	81	0.46	0	187	162	82	5.6	1045	2.0
ME-30	2.8	322	10.1	72	0.47	0	175	96	50	5.3	268	2.0
N	9	9	9	9	9	9	9	9	9	9	9	9
ANIMAL ID	TP ¹³ g/dl	UA ¹⁴ mg/dl	BUN ¹⁵ mg/dl	TBIL ¹⁶ mg/dl	TG ¹⁷ IU/ l	CK ¹⁸ mmol/ l	Na ¹⁹ mmol/ l	K ²⁰ mmol/ l	Cl ²¹ mmol/ l	A/L ²²		
ME-21	6.1	0.9	27.9	0.00	53	758	142	3.9	104	0.85		
ME-22	6.1	1.2	17.2	0.02	40	940	143	4.3	103	0.79		
ME-23	6.5	0.9	17.4	0.02	136	952	142	4.0	102	0.76		
ME-24	6.5	0.8	19.0	0.02	166	675	142	3.8	102	0.76		
ME-25	6.3	1.1	22.4	0.01	128	574	141	4.0	102	0.80		
ME-26	-	-	-	-	-	-	-	-	-	-		
ME-27	6.7	1.2	27.1	0.00	29	1056	145	4.0	102	0.76		
ME-28	6.5	0.8	25.8	0.03	60	320	144	3.8	105	0.81		
ME-29	6.6	0.9	21.1	0.02	127	1030	144	3.9	104	0.78		
ME-30	6.4	0.9	19.4	0.03	81	323	143	4.2	104	0.78		
N	9	9	9	9	9	9	9	9	9	9		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxaloacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-1. Individual biochemistry test of male rats in exposure group (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : High					SEX : MALE			
DOSE : 1.0 mg/m ³												
ANIMAL ID	ALB ¹ g/dl	ALP ² IU/ l	CA ³ mg/dl	CHO ⁴ mg/dl	CRE ⁵ mg/dl	GGT ⁶ IU/ l	GLU ⁷ mg/dl	AST ⁸ mg/dl	ALT ⁹ IU/ l	IP ¹⁰ mg/dl	LDH ¹¹ IU/ l	MG ¹² mg/dl
HE-31	2.9	414	9.2	68	0.57	1	164	126	57	5.5	1115	2.3
HE-32	2.8	438	9.6	76	0.55	1	159	150	55	6.5	1205	2.2
HE-33	2.8	388	9.4	69	0.55	1	162	131	59	6.1	1301	2.1
HE-34	2.7	445	9.5	84	0.54	1	180	136	73	5.7	1081	2.1
HE-35	2.7	359	9.7	74	0.65	1	184	167	84	5.8	555	2.1
HE-36	2.9	420	10.1	88	0.75	0	187	139	71	6.1	974	2.2
HE-37	2.8	368	9.7	86	0.56	0	163	122	58	5.3	858	2.1
HE-38	2.9	408	9.7	68	0.54	0	162	167	99	5.5	1011	2.1
HE-39	2.8	399	9.7	75	0.51	0	174	149	60	5.8	1518	2.1
HE-40	2.8	329	10.1	83	0.52	0	179	138	69	5.4	144	2.0
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	TP ¹³ g/dl	UA ¹⁴ mg/dl	BUN ¹⁵ mg/dl	TBIL ¹⁶ mg/dl	TG ¹⁷ IU/ l	CK ¹⁸ mmol/ l	Na ¹⁹ mmol/ l	K ²⁰ mmol/ l	Cl ²¹ mmol/ l	A/L ²²		
HE-31	6.4	0.9	19.7	0.00	44	720	144	3.9	105	0.83		
HE-32	6.5	1.1	17.7	0.00	70	2138	143	4.2	103	0.76		
HE-33	6.3	1.1	19.1	0.06	105	1112	142	4.0	102	0.80		
HE-34	6.1	0.9	18.5	0.04	116	1096	143	4.0	103	0.79		
HE-35	6.1	1.1	21.5	0.06	104	650	143	4.0	102	0.79		
HE-36	6.7	1.6	28.1	0.00	39	957	144	4.1	102	0.76		
HE-37	6.5	1.3	21.0	0.03	24	834	144	4.1	103	0.76		
HE-38	6.5	1.2	21.2	0.03	37	1761	144	4.3	103	0.81		
HE-39	6.5	1.2	22.9	0.03	59	1357	143	4.2	103	0.76		
HE-40	6.3	0.9	23.2	0.06	47	540	142	4.0	104	0.80		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-2. Individual biochemistry test of female rats in exposure group

INDIVIDUAL BIOCHEMISTRY TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Control					SEX : FEMALE			
DOSE : 0 mg/m ³												
ANIMAL ID	ALB ¹ g/dl	ALP ² IU/ l	CA ³ mg/dl	CHO ⁴ mg/dl	CRE ⁵ mg/dl	GGT ⁶ IU/ l	GLU ⁷ mg/dl	AST ⁸ mg/dl	ALT ⁹ IU/ l	IP ¹⁰ mg/dl	LDH ¹¹ IU/ l	MG ¹² mg/dl
CE-41	3.1	437	8.9	100	0.74	1	140	156	63	5.7	1682	2.4
CE-42	2.9	314	9.3	93	0.61	1	133	124	56	6.9	816	2.2
CE-43	3.0	325	9.2	88	0.53	1	133	101	41	5.4	661	2.1
CE-44	2.7	355	8.7	77	0.52	1	143	123	51	4.7	994	2.0
CE-45	2.9	299	8.6	84	0.56	1	141	110	44	5.5	781	2.1
CE-46	2.8	383	9.2	77	0.72	1	125	158	51	5.1	1840	2.3
CE-47	2.7	318	9.3	89	0.53	1	134	223	91	7.2	1884	2.5
CE-48	2.8	368	9.4	91	0.50	0	124	187	57	5.9	2212	2.4
CE-49	2.8	277	9.6	88	0.46	1	159	143	59	4.8	709	2.1
CE-50	2.8	282	9.8	88	0.52	0	170	134	66	5.3	436	2.1
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	TP ¹³ g/dl	UA ¹⁴ mg/dl	BUN ¹⁵ mg/dl	TBIL ¹⁶ mg/dl	TG ¹⁷ IU/ l	CK ¹⁸ mmol/ l	Na ¹⁹ mmol/ l	K ²⁰ mmol/ l	Cl ²¹ mmol/ l	A/L ²²		
CE-41	6.6	2.0	24.6	0.00	10	1153	135	3.5	112	0.89		
CE-42	6.2	1.1	28.7	0.00	13	596	141	3.6	106	0.88		
CE-43	6.3	1.0	21.8	0.02	10	488	144	3.8	108	0.91		
CE-44	6.0	1.2	21.7	0.02	17	928	143	3.6	105	0.82		
CE-45	6.1	1.1	17.9	0.05	12	773	142	3.9	105	0.91		
CE-46	6.0	1.3	25.1	0.01	9	1548	136	3.3	109	0.88		
CE-47	6.1	1.1	26.5	0.00	16	1878	144	3.8	104	0.79		
CE-48	6.3	1.1	26.6	0.01	14	1826	143	3.7	104	0.80		
CE-49	6.1	0.9	23.7	0.00	27	654	142	3.7	106	0.85		
CE-50	6.2	1.0	26.0	0.00	41	429	141	3.9	105	0.82		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-2. Individual biochemistry test of female rats in exposure group (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Low					SEX : FEMALE			
DOSE : 0.2 mg/m ³												
ANIMAL ID	ALB ¹ g/dl	ALP ² IU/ l	CA ³ mg/dl	CHO ⁴ mg/dl	CRE ⁵ mg/dl	GGT ⁶ IU/ l	GLU ⁷ mg/dl	AST ⁸ mg/dl	ALT ⁹ IU/ l	IP ¹⁰ mg/dl	LDH ¹¹ IU/ l	MG ¹² mg/dl
LE-51	3.1	314	8.7	88	0.61	1	121	229	82	5.9	1588	2.3
LE-52	3.0	293	9.2	107	0.43	1	149	156	75	5.9	946	2.1
LE-53	2.8	390	9.3	81	0.48	1	153	108	52	5.5	677	2.1
LE-54	2.8	384	9.0	80	0.61	2	121	128	57	5.9	815	2.1
LE-55	2.7	435	8.8	70	0.62	2	135	108	44	5.2	834	2.0
LE-56	2.7	331	9.5	75	0.60	1	109	180	64	5.1	2102	2.4
LE-57	2.8	306	9.3	77	0.59	1	116	253	83	6.8	2365	2.3
LE-58	2.8	255	9.5	93	0.50	1	113	208	70	6.4	2185	2.4
LE-59	2.8	229	9.9	89	0.68	0	173	119	52	5.9	575	2.0
LE-60	2.8	260	10.2	104	0.56	1	190	102	51	5.1	320	2.0
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	TP ¹³ g/dl	UA ¹⁴ mg/dl	BUN ¹⁵ mg/dl	TBIL ¹⁶ mg/dl	TG ¹⁷ IU/ l	CK ¹⁸ mmol/ l	Na ¹⁹ mmol/ l	K ²⁰ mmol/ l	Cl ²¹ mmol/ l	A/L ²²		
LE-51	6.5	1.3	26.0	0.02	12	1053	145	3.4	105	0.91		
LE-52	6.5	1.0	27.3	0.00	15	626	144	3.9	106	0.86		
LE-53	5.8	0.9	24.5	0.01	13	643	143	3.6	105	0.93		
LE-54	6.2	1.2	25.8	0.00	18	767	145	3.5	105	0.82		
LE-55	5.8	1.6	22.9	0.00	13	745	144	3.9	107	0.87		
LE-56	6.1	1.5	24.5	0.00	10	1673	145	3.9	106	0.79		
LE-57	6.1	1.2	28.4	0.00	16	1807	145	3.6	105	0.85		
LE-58	6.3	1.2	24.2	0.00	22	1800	144	3.9	105	0.80		
LE-59	6.1	1.2	23.0	0.04	34	680	140	4.1	102	0.85		
LE-60	6.2	1.0	24.4	0.01	34	392	141	4.0	103	0.82		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-2. Individual biochemistry test of female rats in exposure group (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Medium					SEX : FEMALE			
DOSE : 0.5 mg/m ³												
ANIMAL ID	ALB ¹ g/dl	ALP ² IU/ l	CA ³ mg/dl	CHO ⁴ mg/dl	CRE ⁵ mg/dl	GGT ⁶ IU/ l	GLU ⁷ mg/dl	AST ⁸ mg/dl	ALT ⁹ IU/ l	IP ¹⁰ mg/dl	LDH ¹¹ IU/ l	MG ¹² mg/dl
ME-61	2.9	376	8.8	91	0.58	1	123	157	53	5.8	1468	2.3
ME-62	2.7	394	8.5	65	0.57	1	136	159	52	5.4	943	2.2
ME-63	2.8	370	8.9	75	0.52	1	119	167	52	4.3	1676	2.1
ME-64	3.0	289	9.4	104	0.55	2	146	170	69	5.1	1387	2.0
ME-65	3.0	284	9.4	88	0.76	1	133	115	46	6.5	887	2.3
ME-66	3.1	302	9.5	106	0.67	1	114	263	96	7.2	2282	2.5
ME-67	2.7	472	9.3	64	0.58	1	131	170	46	6.4	2164	2.3
ME-68	2.8	387	9.5	94	0.50	1	129	169	46	6.2	1972	2.2
ME-69	2.9	363	9.7	94	0.52	1	171	124	58	4.9	446	2.1
ME-70	3.1	236	10.5	105	0.61	0	167	94	48	5.3	180	2.0
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	TP ¹³ g/dl	UA ¹⁴ mg/dl	BUN ¹⁵ mg/dl	TBIL ¹⁶ mg/dl	TG ¹⁷ IU/ l	CK ¹⁸ mmol/ l	Na ¹⁹ mmol/ l	K ²⁰ mmol/ l	Cl ²¹ mmol/ l	A/L ²²		
ME-61	6.2	1.3	25.4	0.01	10	947	144	3.7	105	0.88		
ME-62	6.0	1.0	24.9	0.00	15	580	146	3.8	107	0.82		
ME-63	5.7	1.6	25.1	0.01	16	1644	144	4.0	106	0.97		
ME-64	6.5	1.5	22.2	0.02	16	1899	144	4.4	105	0.86		
ME-65	6.5	1.8	21.1	0.01	19	916	144	4.1	105	0.86		
ME-66	6.7	1.6	25.5	0.01	11	1852	144	3.6	102	0.86		
ME-67	6.0	1.0	20.2	0.00	14	1725	145	3.9	106	0.82		
ME-68	6.2	1.2	26.9	0.03	21	1616	144	3.8	105	0.82		
ME-69	6.2	1.0	24.9	0.04	30	445	142	3.9	104	0.88		
ME-70	6.7	1.0	23.2	0.04	26	244	142	3.9	104	0.86		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-2. Individual biochemistry test of female rats in exposure group (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : High					SEX : FEMALE			
DOSE : 1.0 mg/m ³												
ANIMAL ID	ALB ¹ g/dl	ALP ² IU/ l	CA ³ mg/dl	CHO ⁴ mg/dl	CRE ⁵ mg/dl	GGT ⁶ IU/ l	GLU ⁷ mg/dl	AST ⁸ mg/dl	ALT ⁹ IU/ l	IP ¹⁰ mg/dl	LDH ¹¹ IU/ l	MG ¹² mg/dl
HE-71	3.0	329	9.0	88	0.58	1	142	169	73	4.7	1293	2.1
HE-72	2.8	407	8.9	72	0.61	1	129	146	48	4.9	1337	2.0
HE-73	3.0	307	9.2	101	0.49	1	121	142	58	5.0	1415	2.2
HE-74	3.0	301	9.1	91	0.54	2	129	247	100	5.2	1417	2.1
HE-75	2.8	377	9.2	83	0.62	3	177	144	90	3.5	434	2.0
HE-76	2.6	390	9.5	99	0.62	1	126	194	50	5.7	2571	2.3
HE-77	2.8	342	9.4	90	0.55	0	129	136	48	5.5	1225	2.2
HE-78	2.8	286	9.8	95	0.51	1	145	125	53	5.2	993	2.1
HE-79	2.8	258	9.9	87	0.50	1	145	169	75	5.6	882	2.0
HE-80	2.7	291	9.8	79	0.52	1	167	103	46	4.8	152	2.1
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	TP ¹³ g/dl	UA ¹⁴ mg/dl	BUN ¹⁵ mg/dl	TBIL ¹⁶ mg/dl	TG ¹⁷ IU/ l	CK ¹⁸ mmol/ l	Na ¹⁹ mmol/ l	K ²⁰ mmol/ l	Cl ²¹ mmol/ l	A/L ²²		
HE-71	6.3	1.7	24.3	0.04	14	798	144	4.1	105	0.91		
HE-72	6.0	1.1	18.0	0.00	14	829	147	4.1	107	0.88		
HE-73	6.4	1.1	21.2	0.03	18	1245	145	3.9	105	0.88		
HE-74	6.5	1.2	26.0	0.01	18	1229	144	3.8	103	0.86		
HE-75	6.1	1.4	22.8	0.00	22	451	147	3.8	107	0.85		
HE-76	6.3	1.7	25.5	0.00	15	2069	145	3.9	105	0.70		
HE-77	6.3	1.2	23.0	0.01	13	1123	144	3.7	105	0.80		
HE-78	6.5	1.1	21.0	0.02	16	908	143	3.8	104	0.76		
HE-79	6.3	1.0	23.3	0.03	20	859	142	3.9	103	0.80		
HE-80	6.2	0.8	20.2	0.01	26	198	142	4.1	108	0.77		
N	10	10	10	10	10	10	10	10	10	10		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Glutamic oxalacetic transaminase; 9, Glutamic pyruvic transaminase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-3. Individual biochemistry test of male rats in recovery group

INDIVIDUAL BIOCHEMISTRY TEST RECOVERY 13WEEKS												
STUDY ID : GT14-00042				GROUP : Control					SEX : MALE			
ANIMAL ID	ALB ¹ g/dL	ALP ² IU/L	CA ³ mg/dL	CHO ⁴ mg/dL	CRE ⁵ mg/dL	GGT ⁶ IU/L	GLU ⁷ mg/dL	AST ⁸ mg/dL	ALT ⁹ IU/L	IP ¹⁰ mg/dL	LDH ¹¹ IU/L	MG ¹² mg/dL
CR-1	2.6	416	9.2	102	0.65	0	109	184	84	5.3	1953	3.6
CR-2	2.6	374	9.3	103	0.51	0	190	187	100	5.8	612	3.1
CR-3	2.8	377	9.7	105	0.63	1	191	88	59	5.5	285	3
CR-4	2.6	375	9.2	101	0.69	0	177	186	96	5.2	892	3
CR-5	2.6	323	9.2	96	0.69	0	188	102	66	5.3	722	2.9
N	5	5	5	5	5	5	5	5	5	5	5	5
ANIMAL ID	TP ¹³ g/dL	UA ¹⁴ mg/dL	BUN ¹⁵ mg/dL	TBIL ¹⁶ mg/dL	TG ¹⁷ mg/dL	CK ¹⁸ IU/L	Na ¹⁹ mmol/L	K ²⁰ mmol/L	Cl ²¹ mmol/L	A/G ²²		
CR-1	6.7	1.8	17.4	0.01	155	791	144	4.5	101	0.63		
CR-2	6.7	0.7	21.3	0.04	115	242	145	3.8	104	0.63		
CR-3	6.8	1	18.8	0	125	222	144	4.2	103	0.70		
CR-4	6.8	0.9	21.1	0.03	229	403	144	4.2	103	0.62		
CR-5	6.9	1	20	0.01	173	385	144	4.2	102	0.60		
N	5	5	5	5	5	5	5	5	5	5		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Aspartate aminotransferase; 9, Alanine aminotransferase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-3. Individual biochemistry test of male rats in recovery group (continued)

INDIVIDUAL BIOCHEMISTRY TEST RECOVERY 13WEEKS												
STUDY ID : GT14-00042				GROUP : Low					SEX : MALE			
ANIMAL ID	ALB ¹ g/dL	ALP ² IU/L	CA ³ mg/dL	CHO ⁴ mg/dL	CRE ⁵ mg/dL	GGT ⁶ IU/L	GLU ⁷ mg/dL	AST ⁸ mg/dL	ALT ⁹ IU/L	IP ¹⁰ mg/dL	LDH ¹¹ IU/L	MG ¹² mg/dL
	LR-6	2.6	424	9.2	107	0.67	0	126	199	77	5.4	2321
LR-7	2.5	315	9	102	0.7	0	216	125	68	5.3	572	2.5
LR-8	2.7	325	9.5	116	0.67	0	188	87	60	5	220	2.5
LR-9	2.5	272	9.5	104	0.66	0	158	150	70	5.9	933	2.6
LR-10	2.6	358	9.8	125	0.69	0	180	300	200	5.8	879	2.7
N	5	5	5	5	5	5	5	5	5	5	5	5
ANIMAL ID	TP ¹³ g/dL	UA ¹⁴ mg/dL	BUN ¹⁵ mg/dL	TBIL ¹⁶ mg/dL	TG ¹⁷ mg/dL	CK ¹⁸ IU/L	Na ¹⁹ mmol/L	K ²⁰ mmol/L	Cl ²¹ mmol/L	A/G ²²		
	LR-6	6.9	1.3	21.5	0.01	58	942	147	4.1	103	0.60	
LR-7	6.4	1	22.8	0	104	287	142	4.1	102	0.64		
LR-8	6.8	0.9	19.9	0.01	172	108	145	3.8	104	0.66		
LR-9	6.7	1	20.7	0.01	101	471	144	4.3	102	0.60		
LR-10	6.8	0.9	20.5	0.02	123	425	143	4.2	101	0.62		
N	5	5	5	5	5	5	5	5	5	5		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Aspartate aminotransferase; 9, Alanine aminotransferase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-3. Individual biochemistry test of male rats in recovery group (continued)

INDIVIDUAL BIOCHEMISTRY TEST RECOVERY 13WEEKS												
STUDY ID : GT14-00042				GROUP : Medium					SEX : MALE			
ANIMAL ID	ALB ¹ g/dL	ALP ² IU/L	CA ³ mg/dL	CHO ⁴ mg/dL	CRE ⁵ mg/dL	GGT ⁶ IU/L	GLU ⁷ mg/dL	AST ⁸ mg/dL	ALT ⁹ IU/L	IP ¹⁰ mg/dL	LDH ¹¹ IU/L	MG ¹² mg/dL
	MR-11	2.5	265	9.2	90	0.84	0	145	189	87	7.6	1967
MR-12	2.7	390	9.3	96	0.8	0	146	170	58	7.1	2398	3.1
MR-13	2.6	414	9.6	99	0.81	0	180	177	95	6.3	1265	2.6
MR-14	2.7	353	9	99	0.79	0	179	274	202	5.7	954	2.6
MR-15	2.6	387	9.9	87	0.67	0	181	158	78	6.1	714	2.8
N	5	5	5	5	5	5	5	5	5	5	5	5
ANIMAL ID	TP ¹³ g/dL	UA ¹⁴ mg/dL	BUN ¹⁵ mg/dL	TBIL ¹⁶ mg/dL	TG ¹⁷ mg/dL	CK ¹⁸ IU/L	Na ¹⁹ mmol/L	K ²⁰ mmol/L	Cl ²¹ mmol/L	A/G ²²		
	MR-11	7	1.3	20.3	0	27	790	148	4.2	101	0.56	
MR-12	7	1.1	23.8	0	59	1062	146	4.2	101	0.63		
MR-13	7	1.5	23	0.02	75	1381	147	4.7	104	0.59		
MR-14	6.9	1.1	20.5	0.04	135	533	143	4.3	102	0.64		
MR-15	6.7	1	22.3	0	144	454	146	4.3	105	0.63		
N	5	5	5	5	5	5	5	5	5	5		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Aspartate aminotransferase; 9, Alanine aminotransferase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 12-3. Individual biochemistry test of male rats in recovery group (continued)

INDIVIDUAL BIOCHEMISTRY TEST												
RECOVERY 13WEEKS												
STUDY ID : GT14-00042				GROUP : High					SEX : MALE			
DOSE : 1.0 mg/m ³												
ANIMAL ID	ALB ¹ g/dL	ALP ² IU/L	CA ³ mg/dL	CHO ⁴ mg/dL	CRE ⁵ mg/dL	GGT ⁶ IU/L	GLU ⁷ mg/dL	AST ⁸ mg/dL	ALT ⁹ IU/L	IP ¹⁰ mg/dL	LDH ¹¹ IU/L	MG ¹² mg/dL
HR-16	2.8	422	9.4	115	0.69	0	130	202	82	6.6	2512	3
HR-17	2.7	382	9.5	116	0.68	0	154	175	86	6.3	1725	2.8
HR-18	2.8	406	9.8	112	0.76	0	194	174	89	5.8	1290	2.7
HR-19	2.8	374	8.3	111	0.66	0	193	170	87	5.2	1255	2.6
HR-20	2.4	294	8.4	89	0.69	0	176	176	94	5.7	919	2.5
N	5	5	5	5	5	5	5	5	5	5	5	5
ANIMAL ID	TP ¹³ g/dL	UA ¹⁴ mg/dL	BUN ¹⁵ mg/dL	TBIL ¹⁶ mg/dL	TG ¹⁷ mg/dL	CK ¹⁸ IU/L	Na ¹⁹ mmol/L	K ²⁰ mmol/L	Cl ²¹ mmol/L	A/G ²²		
HR-16	7.2	1	21.1	0.02	97	1013	150	4.1	104	0.64		
HR-17	6.8	1	19.3	0.01	118	667	146	4.1	102	0.66		
HR-18	7	1.2	22.6	0.02	231	616	145	4.2	102	0.67		
HR-19	6.7	0.8	20	0	248	490	144	4	103	0.72		
HR-20	6.1	1	22.1	0	147	373	142	4.4	104	0.65		
N	5	5	5	5	5	5	5	5	5	5		

1, Albumin; 2, Alkaline phosphatase; 3, Calcium; 4, Cholesterol; 5, Creatinine; 6, Gamma glutamyl transpeptidase; 7, Glucose; 8, Aspartate aminotransferase; 9, Alanine aminotransferase; 10, Inorganic phosphorus; 11, Lactate Dehydrogenase; 12, Magnesium; 13, Total protein; 14, Uric acid; 15, Blood urea nitrogen; 16, Total bilirubin; 17, Triglyceride; 18, Creatine Kinase; 19, Sodium; 20, Potassium; 21, Chloride; 22, ratio of albumin and globulin

Appendix 13-1. Individual hematological test of male rats in exposure group

INDIVIDUAL HEMATOLOGICAL TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Control					SEX : MALE			
DOSE : 0 mg/m ³												
ANIMAL ID	WBC ¹ K/ μ L	RBC ² M/ μ L	HGB ³ g/dL	HCT ⁴ %	MCV ⁵ fL	MCH ⁶ pg	MCHC ⁷ g/dL	RDW ⁸ %	PLT ⁹ K/ μ L	MPV ¹⁰ fL	NEP ¹¹ %	LYP ¹² %
CE-1	4.18	9.00	15.4	43.5	48.4	17.1	35.4	13.3	793	6.1	57.4	39.3
CE-2	3.87	9.13	14.8	42.8	46.9	16.2	34.6	12.7	669	7.0	45.1	51.2
CE-3	5.68	9.21	15.3	44.1	47.9	16.6	34.6	12.5	718	7.3	42.1	54.2
CE-4	3.82	9.26	15.2	43.6	47.1	16.4	34.8	12.6	839	6.2	32.1	63.1
CE-5	5.01	9.59	16.1	45.8	47.8	16.8	35.3	12.1	793	6.0	28.3	66.2
CE-6	2.79	9.64	16.0	46.7	48.5	16.6	34.3	12.8	590	7.4	34.8	60.0
CE-7	3.27	9.01	15.1	43.4	48.1	16.8	34.8	12.9	789	7.2	48.6	47.0
CE-8	2.71	9.11	15.2	43.6	47.8	16.7	35.0	13.1	643	7.1	45.1	51.1
CE-9	3.36	9.22	15.3	43.5	47.1	16.6	35.3	14.3	1003	5.8	47.8	48.7
CE-10	3.19	9.14	15.4	43.4	47.5	16.8	35.4	12.7	723	5.3	47.3	48.7
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	MOP ¹³ %	EOP ¹⁴ %	LUP ¹⁵ %	BAP ¹⁶ %	NE ¹⁷ K/ μ L	LYM ¹⁸ K/ μ L	MO ¹⁹ K/ μ L	EO ²⁰ K/ μ L	LUC ²¹ K/ μ L	BA ²² K/ μ L	Reti ²³ %	
CE-1	1.6	1.1	0.6	0.1	2.40	1.64	0.06	0.05	0.02	0.00	2.54	
CE-2	1.7	1.3	0.5	0.1	1.75	1.98	0.07	0.05	0.02	0.00	2.47	
CE-3	2.0	0.9	0.7	0.1	2.39	3.08	0.12	0.05	0.04	0.01	2.44	
CE-4	1.9	1.7	1.2	0.0	1.23	2.41	0.07	0.06	0.05	0.00	2.41	
CE-5	2.5	1.6	1.3	0.1	1.42	3.32	0.12	0.08	0.06	0.01	1.76	
CE-6	1.7	3.2	0.3	0.0	0.97	1.67	0.05	0.09	0.01	0.00	2.41	
CE-7	1.8	2.1	0.2	0.1	1.59	1.54	0.06	0.07	0.01	0.00	2.29	
CE-8	1.8	1.4	0.6	0.0	1.22	1.38	0.05	0.04	0.02	0.00	2.25	
CE-9	1.3	1.2	0.9	0.1	1.61	1.64	0.04	0.04	0.03	0.00	3.21	
CE-10	1.5	1.5	0.9	0.1	1.51	1.55	0.05	0.05	0.03	0.00	2.18	
N	10	10	10	10	10	10	10	10	10	10	10	

1. White blood cel; 2. Red blood cell; 3. Hemoglobin; 4. Hematocrit; 5. Mean corpuscular volume; 6. Mean corpuscular hemoglobin; 7. Mean corpuscular hemoglobin concentration; 8. Red cell distribution width; 9. Platelet; 10. Mean platelet volume; 11. Percent of neutrophils; 12. Percent of lymphocyte; 13. Percent of monocyte; 14. Percent of eosinophil; 15. Percent of large unstained cel; 16. Percent of basophil; 17. Neutrophils; 18. Lymphocyte; 19. Monocyte; 20. Eosinophil; 21. Large unstained cell; 22. Basophil; 23. Reticulocyte;

Appendix 13-1. Individual hematological test of male rats in exposure group (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Low					SEX : MALE			
DOSE : 0.2 mg/m ³												
ANIMAL ID	WBC ¹ K/ μ L	RBC ² M/ μ L	HGB ³ g/dL	HCT ⁴ %	MCV ⁵ fL	MCH ⁶ pg	MCHC ⁷ g/dL	RDW ⁸ %	PLT ⁹ K/ μ L	MPV ¹⁰ fL	NEP ¹¹ %	LYP ¹² %
LE-11	3.85	9.40	15.6	44.4	47.2	16.6	35.2	12.6	697	5.8	55.2	41.5
LE-12	2.11	9.24	15.2	45.0	48.7	16.5	33.8	13.0	705	7.8	31.4	64.3
LE-13	4.73	9.27	15.5	44.3	47.7	16.7	35.0	12.8	796	6.0	22.4	72.8
LE-14	5.19	9.64	15.7	45.0	46.7	16.3	34.9	12.8	866	5.6	28.8	67.1
LE-15	5.75	9.47	15.7	45.4	48.0	16.5	34.5	13.0	806	6.1	27.5	67.9
LE-16	3.05	9.37	15.9	47.2	50.4	17.0	33.7	13.0	574	7.3	30.4	64.3
LE-17	3.35	9.32	15.6	45.1	48.4	16.7	34.5	12.5	693	7.4	30.3	66.3
LE-18	3.65	9.40	16.0	45.6	48.5	17.1	35.1	12.8	778	7.5	26.9	69.5
LE-19	3.70	9.30	15.7	45.1	48.5	16.9	34.8	13.3	740	5.0	23.9	72.9
LE-20	2.96	9.20	15.4	43.2	46.9	16.8	35.8	12.5	783	6.2	32.9	62.3
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	MOP ¹³ %	EOP ¹⁴ %	LUP ¹⁵ %	BAP ¹⁶ %	NE ¹⁷ K/ μ L	LYM ¹⁸ K/ μ L	MO ¹⁹ K/ μ L	EO ²⁰ K/ μ L	LUC ²¹ K/ μ L	BA ²² K/ μ L	Reti ²³ %	
LE-11	1.5	1.0	0.6	0.2	2.13	1.60	0.06	0.04	0.02	0.01	1.91	
LE-12	2.1	1.6	0.6	0.1	0.66	1.36	0.04	0.03	0.01	0.00	2.71	
LE-13	2.0	1.5	1.3	0.1	1.06	3.44	0.09	0.07	0.06	0.00	2.17	
LE-14	1.6	1.5	0.9	0.1	1.49	3.48	0.09	0.08	0.05	0.00	2.44	
LE-15	2.4	0.9	1.3	0.1	1.58	3.90	0.14	0.05	0.07	0.00	2.54	
LE-16	1.7	2.6	0.8	0.2	0.93	1.96	0.05	0.08	0.02	0.01	2.11	
LE-17	1.2	1.8	0.4	0.0	1.01	2.22	0.04	0.06	0.01	0.00	2.13	
LE-18	1.6	1.7	0.3	0.0	0.98	2.53	0.06	0.06	0.01	0.00	2.55	
LE-19	1.1	1.6	0.3	0.1	0.89	2.70	0.04	0.06	0.01	0.00	3.00	
LE-20	2.1	1.7	1.0	0.0	0.97	1.85	0.06	0.05	0.03	0.00	2.42	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 13-1. Individual hematological test of male rats in exposure group (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Medium					SEX : MALE			
DOSE : 0.5 mg/m ³												
ANIMAL ID	WBC ¹ K/ μ L	RBC ² M/ μ L	HGB ³ g/dL	HCT ⁴ %	MCV ⁵ fL	MCH ⁶ pg	MCHC ⁷ g/dL	RDW ⁸ %	PLT ⁹ K/ μ L	MPV ¹⁰ fL	NEP ¹¹ %	LYP ¹² %
ME-21	3.87	9.66	16.1	46.3	47.9	16.7	34.8	12.6	714	5.9	28.4	66.5
ME-22	2.80	8.97	14.8	43.8	48.8	16.5	33.9	14.8	794	6.3	36.4	59.8
ME-23	4.39	9.72	15.9	45.7	47.0	16.4	34.8	13.1	731	5.3	35.9	59.2
ME-24	4.45	9.69	16.2	48.3	49.8	16.7	33.5	11.9	768	8.3	27.5	68.6
ME-25	4.66	9.68	16.2	46.2	47.7	16.8	35.1	13.2	727	5.1	26.3	69.7
ME-26	-	-	-	-	-	-	-	-	-	-	-	-
ME-27	4.62	9.25	15.5	45.4	49.1	16.7	34.1	12.6	747	7.8	62.3	34.9
ME-28	4.89	8.98	15.2	43.5	48.4	17.0	35.0	12.5	731	7.2	53.1	43.0
ME-29	5.28	9.73	16.4	46.7	48.0	16.8	35.0	12.9	682	6.2	33.7	61.8
ME-30	2.94	9.36	15.6	44.3	47.3	16.6	35.1	12.8	805	5.5	43.4	52.6
N	9	9	9	9	9	9	9	9	9	9	9	9
ANIMAL ID	MOP ¹³ %	EOP ¹⁴ %	LUP ¹⁵ %	BAP ¹⁶ %	NE ¹⁷ K/ μ L	LYM ¹⁸ K/ μ L	MO ¹⁹ K/ μ L	EO ²⁰ K/ μ L	LUC ²¹ K/ μ L	BA ²² K/ μ L	Reti ²³ %	
ME-21	2.5	1.7	1.0	0.0	1.10	2.57	0.10	0.06	0.04	0.00	1.92	
ME-22	1.5	1.3	0.9	0.0	1.02	1.67	0.04	0.04	0.03	0.00	3.17	
ME-23	2.3	1.5	1.0	0.0	1.58	2.60	0.10	0.07	0.04	0.00	2.79	
ME-24	1.8	1.3	0.6	0.2	1.22	3.05	0.08	0.06	0.03	0.01	1.95	
ME-25	1.2	1.7	1.0	0.1	1.22	3.24	0.06	0.08	0.05	0.01	2.40	
ME-26	-	-	-	-	-	-	-	-	-	-	-	
ME-27	1.1	1.1	0.5	0.0	2.88	1.62	0.05	0.05	0.02	0.00	2.17	
ME-28	1.5	1.4	0.7	0.3	2.60	2.10	0.07	0.07	0.03	0.01	1.97	
ME-29	2.1	1.3	0.9	0.1	1.78	3.26	0.11	0.07	0.05	0.00	2.13	
ME-30	1.3	1.8	0.7	0.2	1.27	1.55	0.04	0.05	0.02	0.01	2.41	
N	9	9	9	9	9	9	9	9	9	9	9	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 13-1. Individual hematological test of male rats in exposure group (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : High					SEX : MALE			
DOSE : 1.0 mg/m ³												
ANIMAL ID	WBC ¹ K/ μ L	RBC ² M/ μ L	HGB ³ g/dL	HCT ⁴ %	MCV ⁵ fL	MCH ⁶ pg	MCHC ⁷ g/dL	RDW ⁸ %	PLT ⁹ K/ μ L	MPV ¹⁰ fL	NEP ¹¹ %	LYP ¹² %
HE-31	3.99	9.34	15.5	44.1	47.3	16.6	35.1	12.3	710	6.3	42.1	54.5
HE-32	6.09	9.12	15.3	42.6	46.7	16.8	35.9	12.9	728	6.2	57.5	37.7
HE-33	4.13	9.61	15.8	45.3	47.1	16.4	34.8	13.0	771	5.8	29.5	66.8
HE-34	4.23	9.45	15.7	44.6	47.2	16.6	35.1	12.8	617	5.3	54.0	41.0
HE-35	3.80	9.31	15.4	43.9	47.1	16.5	35.1	12.6	717	5.0	28.2	67.6
HE-36	4.12	9.18	15.3	45.2	49.2	16.6	33.8	12.7	670	7.4	27.8	67.8
HE-37	2.67	8.99	15.2	43.6	48.5	16.9	34.9	12.4	746	7.4	36.3	58.4
HE-38	2.00	9.64	15.8	44.6	46.2	16.4	35.5	13.0	573	5.6	33.1	62.9
HE-39	4.63	9.41	15.6	44.7	47.5	16.6	34.9	12.6	783	6.4	36.8	60.2
HE-40	3.01	9.41	16.0	45.0	47.9	17.0	35.4	12.6	783	6.3	32.0	63.6
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	MOP ¹³ %	EOP ¹⁴ %	LUP ¹⁵ %	BAP ¹⁶ %	NE ¹⁷ K/ μ L	LYM ¹⁸ K/ μ L	MO ¹⁹ K/ μ L	EO ²⁰ K/ μ L	LUC ²¹ K/ μ L	BA ²² K/ μ L	Reti ²³ %	
HE-31	1.3	1.3	0.7	0.1	1.68	2.18	0.05	0.05	0.03	0.00	2.04	
HE-32	2.7	0.8	1.2	0.0	3.50	2.30	0.17	0.05	0.07	0.00	2.20	
HE-33	1.5	1.3	0.9	0.0	1.22	2.76	0.06	0.05	0.04	0.00	2.33	
HE-34	2.3	1.5	1.1	0.0	2.28	1.73	0.10	0.06	0.05	0.00	1.78	
HE-35	1.5	1.3	1.3	0.0	1.07	2.57	0.06	0.05	0.05	0.00	2.43	
HE-36	1.6	1.9	0.8	0.1	1.15	2.79	0.07	0.08	0.03	0.00	2.53	
HE-37	1.5	2.7	0.9	0.1	0.97	1.56	0.04	0.07	0.02	0.00	2.49	
HE-38	1.2	1.8	0.8	0.2	0.66	1.26	0.02	0.04	0.02	0.00	2.35	
HE-39	1.4	0.9	0.6	0.1	1.70	2.78	0.07	0.04	0.03	0.01	2.25	
HE-40	1.8	1.8	0.8	0.0	0.96	1.91	0.05	0.05	0.02	0.00	2.20	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 13-2. Individual hematological test of female rats in exposure group

INDIVIDUAL HEMATOLOGICAL TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Control					SEX : FEMALE			
DOSE : 0 mg/m ³												
ANIMAL ID	WBC ¹ K/ μ L	RBC ² M/ μ L	HGB ³ g/dL	HCT ⁴ %	MCV ⁵ fL	MCH ⁶ pg	MCHC ⁷ g/dL	RDW ⁸ %	PLT ⁹ K/ μ L	MPV ¹⁰ fL	NEP ¹¹ %	LYP ¹² %
CE-41	1.43	8.74	15.6	43.8	50.1	17.8	35.5	11.3	789	5.8	40.8	56.6
CE-42	4.51	8.61	15.7	44.2	51.3	18.2	35.4	11.2	796	8.0	19.2	78.0
CE-43	2.95	8.66	15.3	42.4	48.9	17.6	36.0	11.5	752	5.8	16.2	80.3
CE-44	3.63	8.67	15.3	42.7	49.2	17.7	35.9	11.1	775	6.5	33.5	62.4
CE-45	3.34	8.17	2.1	41.0	50.3	2.6	5.2	11.1	688	7.1	15.5	80.4
CE-46	1.74	8.50	15.1	42.4	49.9	17.8	35.6	11.5	673	5.3	31.5	65.8
CE-47	2.81	8.93	15.7	45.0	50.4	17.5	34.8	11.6	839	7.8	23.7	73.3
CE-48	2.44	8.87	15.7	44.0	49.6	17.7	35.8	11.4	822	5.8	23.5	73.2
CE-49	3.56	9.30	16.4	45.8	49.2	17.7	35.9	11.7	837	7.2	26.2	69.2
CE-50	2.90	9.15	16.1	45.5	49.7	17.6	35.5	11.4	760	6.8	20.0	75.7
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	MOP ¹³ %	EOP ¹⁴ %	LUP ¹⁵ %	BAP ¹⁶ %	NE ¹⁷ K/ μ L	LYM ¹⁸ K/ μ L	MO ¹⁹ K/ μ L	EO ²⁰ K/ μ L	LUC ²¹ K/ μ L	BA ²² K/ μ L	Reti ²³ %	
CE-41	1.2	1.1	0.3	0.0	0.58	0.81	0.02	0.02	0.00	0.00	2.44	
CE-42	1.0	1.0	0.7	0.1	0.87	3.52	0.05	0.05	0.03	0.00	2.04	
CE-43	1.4	1.7	0.4	0.1	0.48	2.37	0.04	0.05	0.01	0.00	2.44	
CE-44	1.5	1.4	1.1	0.1	1.22	2.27	0.05	0.05	0.04	0.00	1.89	
CE-45	1.3	1.6	1.0	0.2	0.52	2.68	0.04	0.05	0.03	0.01	2.00	
CE-46	1.3	1.4	0.1	0.0	0.55	1.14	0.02	0.02	0.00	0.00	2.38	
CE-47	0.9	1.4	0.6	0.0	0.66	2.06	0.03	0.04	0.02	0.00	2.35	
CE-48	1.5	1.2	0.4	0.2	0.57	1.79	0.04	0.03	0.01	0.00	2.40	
CE-49	1.9	1.7	1.0	0.1	0.93	2.46	0.07	0.06	0.03	0.00	2.24	
CE-50	2.0	1.3	0.9	0.1	0.58	2.20	0.06	0.04	0.02	0.00	2.00	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 13-2. Individual hematological test of female rats in exposure group (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Low					SEX : FEMALE			
DOSE : 0.2 mg/m ³												
ANIMAL ID	WBC ¹ K/ μ L	RBC ² M/ μ L	HGB ³ g/dL	HCT ⁴ %	MCV ⁵ fL	MCH ⁶ pg	MCHC ⁷ g/dL	RDW ⁸ %	PLT ⁹ K/ μ L	MPV ¹⁰ fL	NEP ¹¹ %	LYP ¹² %
LE-51	2.04	8.86	15.9	44.3	50.0	17.9	35.8	11.3	792	5.2	31.1	67.6
LE-52	2.66	8.57	15.1	42.1	49.2	17.6	35.8	11.0	739	6.4	22.7	73.7
LE-53	3.39	8.73	15.4	43.0	49.2	17.6	35.7	11.3	781	5.7	21.4	75.7
LE-54	3.68	9.02	16.0	45.5	50.5	17.8	35.2	11.4	696	7.4	21.6	75.0
LE-55	2.63	8.64	15.5	43.3	50.1	17.9	35.7	11.4	731	6.6	23.0	73.5
LE-56	1.70	8.39	14.9	41.9	49.9	17.7	35.5	11.4	655	5.3	31.3	66.7
LE-57	1.54	8.91	15.9	43.7	49.1	17.9	36.5	11.2	359	6.4	27.9	67.4
LE-58	2.45	9.01	16.0	44.1	49.0	17.8	36.3	11.1	796	5.4	29.1	68.1
LE-59	2.09	8.92	16.0	44.4	49.8	17.9	36.1	11.4	771	7.0	18.5	76.6
LE-60	2.71	8.90	15.8	43.5	48.9	17.8	36.3	11.4	665	5.7	25.2	68.1
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	MOP ¹³ %	EOP ¹⁴ %	LUP ¹⁵ %	BAP ¹⁶ %	NE ¹⁷ K/ μ L	LYM ¹⁸ K/ μ L	MO ¹⁹ K/ μ L	EO ²⁰ K/ μ L	LUC ²¹ K/ μ L	BA ²² K/ μ L	Reti ²³ %	
LE-51	0.5	0.3	0.4	0.1	0.63	1.38	0.01	0.01	0.01	0.00	2.32	
LE-52	1.5	1.0	1.0	0.1	0.60	1.96	0.04	0.03	0.03	0.00	1.64	
LE-53	1.5	0.8	0.6	0.1	0.72	2.56	0.05	0.03	0.02	0.00	2.41	
LE-54	1.1	1.4	0.6	0.2	0.80	2.76	0.04	0.05	0.02	0.01	2.06	
LE-55	1.2	1.4	0.6	0.2	0.61	1.94	0.03	0.04	0.02	0.00	2.23	
LE-56	0.8	0.7	0.3	0.2	0.53	1.13	0.01	0.01	0.01	0.00	2.25	
LE-57	0.9	3.0	0.8	0.1	0.43	1.04	0.01	0.05	0.01	0.00	1.99	
LE-58	1.3	1.0	0.5	0.0	0.71	1.67	0.03	0.02	0.01	0.00	1.98	
LE-59	2.0	1.6	1.2	0.0	0.39	1.60	0.04	0.03	0.02	0.00	2.05	
LE-60	1.2	4.3	0.9	0.2	0.68	1.85	0.03	0.12	0.02	0.01	2.28	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 13-2. Individual hematological test of female rats in exposure group (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : Medium					SEX : FEMALE			
DOSE : 0.5 mg/m ³												
ANIMAL ID	WBC ¹ K/ μ L	RBC ² M/ μ L	HGB ³ g/dL	HCT ⁴ %	MCV ⁵ fL	MCH ⁶ pg	MCHC ⁷ g/dL	RDW ⁸ %	PLT ⁹ K/ μ L	MPV ¹⁰ fL	NEP ¹¹ %	LYP ¹² %
ME-61	2.43	8.34	14.9	41.5	49.8	17.9	36.0	11.3	761	4.9	19.3	78.9
ME-62	3.06	9.13	16.0	45.3	49.6	17.5	35.3	10.8	784	6.3	24.5	73.0
ME-63	2.50	9.00	15.7	44.8	49.8	17.5	35.1	11.4	884	7.8	25.6	70.0
ME-64	3.04	9.04	16.0	44.3	49.0	17.7	36.1	11.1	745	7.2	17.5	78.0
ME-65	2.89	8.71	15.4	44.1	50.6	17.7	35.0	11.1	835	6.5	22.9	72.5
ME-66	2.13	8.81	15.6	43.9	49.8	17.7	35.6	11.0	850	5.1	28.6	69.7
ME-67	2.82	8.55	15.2	42.9	50.1	17.8	35.4	11.6	772	5.3	33.9	62.1
ME-68	2.79	8.27	14.9	41.7	50.4	18.0	35.8	11.3	792	7.9	36.6	59.3
ME-69	2.85	9.42	16.6	46.1	48.9	17.6	36.0	11.1	743	6.8	30.4	65.5
ME-70	2.59	8.81	15.8	43.2	49.0	17.9	36.6	11.1	728	5.7	22.9	73.1
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	MOP ¹³ %	EOP ¹⁴ %	LUP ¹⁵ %	BAP ¹⁶ %	NE ¹⁷ K/ μ L	LYM ¹⁸ K/ μ L	MO ¹⁹ K/ μ L	EO ²⁰ K/ μ L	LUC ²¹ K/ μ L	BA ²² K/ μ L	Reti ²³ %	
ME-61	0.5	0.7	0.6	0.0	0.47	1.92	0.01	0.02	0.01	0.00	2.56	
ME-62	1.5	0.6	0.5	0.0	0.75	2.23	0.04	0.02	0.02	0.00	1.87	
ME-63	1.5	2.2	0.6	0.0	0.64	1.75	0.04	0.06	0.02	0.00	2.33	
ME-64	2.0	1.4	1.0	0.1	0.53	2.37	0.06	0.04	0.03	0.00	1.91	
ME-65	2.0	1.3	1.2	0.1	0.66	2.09	0.06	0.04	0.04	0.00	2.26	
ME-66	0.7	0.5	0.4	0.2	0.61	1.48	0.01	0.01	0.01	0.00	2.23	
ME-67	1.4	1.8	0.8	0.0	0.96	1.75	0.04	0.05	0.02	0.00	2.10	
ME-68	0.9	2.7	0.5	0.0	1.02	1.66	0.02	0.07	0.01	0.00	2.53	
ME-69	1.6	1.5	0.9	0.1	0.87	1.87	0.05	0.04	0.03	0.00	1.88	
ME-70	1.7	1.3	0.9	0.1	0.59	1.89	0.04	0.03	0.02	0.00	2.22	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 13-2. Individual hematological test of female rats in exposure group (continued)

INDIVIDUAL HEMATOLOGICAL TEST												
EXPOSURE 13WEEKS												
STUDY ID : GT14-00042				GROUP : High					SEX : FEMALE			
DOSE : 1.0 mg/m ³												
ANIMAL ID	WBC ¹ K/ μ L	RBC ² M/ μ L	HGB ³ g/dL	HCT ⁴ %	MCV ⁵ fL	MCH ⁶ pg	MCHC ⁷ g/dL	RDW ⁸ %	PLT ⁹ K/ μ L	MPV ¹⁰ fL	NEP ¹¹ %	LYP ¹² %
HE-71	2.11	8.69	15.5	43.0	49.5	17.9	36.1	11.4	745	7.1	21.4	74.5
HE-72	1.73	8.53	15.2	43.7	51.2	17.9	34.9	11.6	605	7.2	39.1	55.4
HE-73	4.52	9.02	16.1	45.1	50.0	17.8	35.6	11.1	756	8.2	17.0	79.7
HE-74	4.40	9.32	16.1	46.4	49.8	17.3	34.7	11.4	816	7.5	21.3	75.5
HE-75	2.10	9.01	16.0	44.8	49.7	17.7	35.7	11.5	763	6.2	30.3	64.5
HE-76	2.14	8.39	14.8	41.3	49.1	17.7	36.0	11.9	862	5.5	34.0	62.9
HE-77	1.87	8.71	15.3	43.1	49.6	17.6	35.4	11.1	745	5.4	24.2	71.8
HE-78	2.78	8.83	15.8	43.4	49.1	17.9	36.5	11.2	766	7.4	28.3	67.6
HE-79	3.34	9.02	16.2	45.0	49.9	17.9	35.9	11.2	787	7.4	21.6	74.2
HE-80	2.55	9.22	16.3	44.8	48.6	17.7	36.5	11.2	750	5.1	30.6	64.2
N	10	10	10	10	10	10	10	10	10	10	10	10
ANIMAL ID	MOP ¹³ %	EOP ¹⁴ %	LUP ¹⁵ %	BAP ¹⁶ %	NE ¹⁷ K/ μ L	LYM ¹⁸ K/ μ L	MO ¹⁹ K/ μ L	EO ²⁰ K/ μ L	LUC ²¹ K/ μ L	BA ²² K/ μ L	Reti ²³ %	
HE-71	1.4	1.9	0.6	0.1	0.45	1.57	0.03	0.04	0.01	0.00	2.07	
HE-72	1.4	3.1	0.7	0.2	0.68	0.96	0.02	0.05	0.01	0.00	2.50	
HE-73	1.2	1.3	0.7	0.1	0.77	3.60	0.05	0.06	0.03	0.00	2.34	
HE-74	1.5	1.1	0.5	0.1	0.94	3.32	0.07	0.05	0.02	0.00	1.97	
HE-75	1.7	2.2	1.2	0.2	0.64	1.35	0.04	0.05	0.02	0.00	2.33	
HE-76	0.9	1.4	0.4	0.3	0.73	1.35	0.02	0.03	0.01	0.01	2.92	
HE-77	1.7	1.8	0.5	0.0	0.45	1.35	0.03	0.03	0.01	0.00	2.23	
HE-78	1.7	1.6	0.6	0.1	0.78	1.88	0.05	0.05	0.02	0.00	1.90	
HE-79	2.2	1.2	0.7	0.1	0.72	2.48	0.07	0.04	0.02	0.00	1.94	
HE-80	2.1	2.2	0.8	0.0	0.78	1.64	0.05	0.06	0.02	0.00	2.10	
N	10	10	10	10	10	10	10	10	10	10	10	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 13-3. Individual hematological test of male rats in recovery group

INDIVIDUAL HEMATOLOGICAL TEST												
RECOVERY 13WEEKS												
STUDY ID : GT14-00042				GROUP : Control					SEX : MALE			
DOSE : 0 mg/m ³												
ANIMAL ID	WBC ¹ K/ μ L	NE ² K/ μ L	LY ³ K/ μ L	MO ⁴ K/ μ L	EO ⁵ K/ μ L	LUC ⁶ K/ μ L	BA ⁷ K/ μ L	NE ⁸ %	LY ⁹ %	MO ¹⁰ %	EO ¹¹ %	LUP ¹² %
CR-1	3.35	1.09	2.14	0.05	0.05	0.01	0	32.5	63.9	1.5	1.6	0.4
CR-2	3.73	1.16	2.46	0.04	0.05	0.02	0	31.1	66.1	1	1.3	0.5
CR-3	3.59	1.27	2.17	0.06	0.05	0.03	0	35.5	60.5	1.8	1.4	0.7
CR-4	3.49	1.08	2.27	0.05	0.07	0.03	0	31	64.9	1.3	1.9	0.8
CR-5	3.38	1.2	2.03	0.07	0.06	0.02	0	35.4	60.2	2	1.9	0.4
N	5	5	5	5	5	5	5	5	5	5	5	5
ANIMAL ID	BA ¹³ %	RBC ¹⁴ M/ μ L	HGB ¹⁵ g/dL	HCT ¹⁶ %	MCV ¹⁷ fL	MCH ¹⁸ pg	MCHC ¹⁹ g/dL	RDW ²⁰ %	PLT ²¹ K/ μ L	MPV ²² fL	Reti ²³	
CR-1	0	9.38	15.3	46.2	49.3	16.3	33.1	12.7	585	8.8	2.18	
CR-2	0	9.38	15.4	45.9	48.9	16.5	33.7	13.2	675	9.3	2.49	
CR-3	0.1	9.56	15.6	45.9	48	16.3	34	13.3	789	8.3	2.71	
CR-4	0	9.84	12.7	47.4	48.2	12.9	26.7	13	687	7.5	2.17	
CR-5	0	9.96	16.1	47.4	47.5	16.1	33.9	12.8	701	6.9	1.97	
N	5	5	5	5	5	5	5	5	5	5	5	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 13-3. Individual hematological test of male rats in recovery group (continued)

INDIVIDUAL HEMATOLOGICAL TEST RECOVERY 13WEEKS												
STUDY ID : GT14-00042				GROUP : Low					SEX : MALE			
ANIMAL ID	WBC ¹ K/ μ L	NE ² K/ μ L	LY ³ K/ μ L	MO ⁴ K/ μ L	EO ⁵ K/ μ L	LUC ⁶ K/ μ L	BA ⁷ K/ μ L	NE ⁸ %	LY ⁹ %	MO ¹⁰ %	EO ¹¹ %	LUP ¹² %
LR-6	3.24	1.31	1.78	0.05	0.08	0.02	0	40.3	54.9	1.7	2.5	0.5
LR-7	3.86	1.19	2.56	0.05	0.04	0.02	0	30.8	66.2	1.2	1.1	0.5
LR-8	3.71	0.95	2.63	0.05	0.04	0.03	0	25.5	70.9	1.5	1.1	0.9
LR-9	3.27	1.12	2	0.06	0.05	0.03	0	34.3	61.2	1.8	1.6	1
LR-10	3.04	1.1	1.8	0.06	0.04	0.04	0	36.3	59.2	1.9	1.2	1.2
N	5	5	5	5	5	5	5	5	5	5	5	5

ANIMAL ID	BA ¹³ %	RBC ¹⁴ M/ μ L	HGB ¹⁵ g/dL	HCT ¹⁶ %	MCV ¹⁷ fL	MCH ¹⁸ pg	MCHC ¹⁹ g/dL	RDW ²⁰ %	PLT ²¹ K/ μ L	MPV ²² fL	Reti ²³
LR-6	0.1	9.69	15.5	47.7	49.3	16	32.4	12.7	583	8.7	2.25
LR-7	0.1	9.33	15.6	45.7	49	16.7	34.1	13.2	701	9.5	2.6
LR-8	0	9.79	16.1	47.7	48.7	16.5	33.8	12.9	749	9	2.16
LR-9	0	9.78	15.6	47	48	15.9	33.2	12.8	812	8.2	2.09
LR-10	0.2	9.6	15.2	45.4	47.3	15.8	33.5	13.7	804	6.1	2.34
N	5	5	5	5	5	5	5	5	5	5	5

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 13-3. Individual hematological test of male rats in recovery group (continued)

INDIVIDUAL HEMATOLOGICAL TEST RECOVERY 13WEEKS												
STUDY ID : GT14-00042				GROUP : Medium					SEX : MALE			
ANIMAL ID	WBC ¹ K/ μ L	NE ² K/ μ L	LY ³ K/ μ L	MO ⁴ K/ μ L	EO ⁵ K/ μ L	LUC ⁶ K/ μ L	BA ⁷ K/ μ L	NE ⁸ %	LY ⁹ %	MO ¹⁰ %	EO ¹¹ %	LUP ¹² %
MR-11	4.05	2.23	1.7	0.06	0.04	0.02	0	54.9	41.9	1.5	1.1	0.5
MR-12	4.52	1.9	2.47	0.07	0.06	0.02	0	42.1	54.6	1.6	1.3	0.4
MR-13	3.57	1.4	2.03	0.05	0.07	0.02	0.01	39.2	56.9	1.3	2	0.6
MR-14	4.15	1.61	2.37	0.09	0.05	0.03	0	38.9	57.1	2.1	1.1	0.8
MR-15	4.42	1.93	2.27	0.11	0.07	0.04	0	43.7	51.3	2.4	1.6	0.9
N	5	5	5	5	5	5	5	5	5	5	5	5
ANIMAL ID	BA ¹³ %	RBC ¹⁴ M/ μ L	HGB ¹⁵ g/dL	HCT ¹⁶ %	MCV ¹⁷ fL	MCH ¹⁸ pg	MCHC ¹⁹ g/dL	RDW ²⁰ %	PLT ²¹ K/ μ L	MPV ²² fL	Reti ²³	
MR-11	0.1	9.95	16	50.7	51	16.1	31.5	13.1	571	9.2	1.99	
MR-12	0	9.44	15.3	47.2	50	16.3	32.5	12.5	569	8.9	2.12	
MR-13	0.1	9.65	15.6	45.6	47.2	16.1	34.2	13.3	784	7.9	2.33	
MR-14	0	9.5	15.2	45.8	48.2	16	33.3	12.6	746	7.8	2.3	
MR-15	0.1	10	16	47.6	47.6	16	33.6	13	811	6.3	2.17	
N	5	5	5	5	5	5	5	5	5	5	5	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 13-3. Individual hematological test of male rats in recovery group (continued)

INDIVIDUAL HEMATOLOGICAL TEST RECOVERY 13WEEKS												
STUDY ID : GT14-00042				GROUP : High					SEX : MALE			
ANIMAL ID	WBC ¹ K/ μ L	NE ² K/ μ L	LY ³ K/ μ L	MO ⁴ K/ μ L	EO ⁵ K/ μ L	LUC ⁶ K/ μ L	BA ⁷ K/ μ L	NE ⁸ %	LY ⁹ %	MO ¹⁰ %	EO ¹¹ %	LUP ¹² %
HR-16	3.51	1.23	2.14	0.07	0.06	0.01	0	35.1	60.9	1.9	1.7	0.4
HR-17	3.27	1.28	1.86	0.05	0.05	0.02	0	39.1	57	1.6	1.6	0.7
HR-18	4.71	1.79	2.72	0.08	0.06	0.05	0	38.1	57.7	1.8	1.4	1
HR-19	3.32	1.02	2.16	0.04	0.06	0.03	0	30.8	65.2	1.1	1.9	1
HR-20	4.6	1.5	2.93	0.06	0.07	0.03	0	32.7	63.8	1.4	1.5	0.6
N	5	5	5	5	5	5	5	5	5	5	5	5
ANIMAL ID	BA ¹³ %	RBC ¹⁴ M/ μ L	HGB ¹⁵ g/dL	HCT ¹⁶ %	MCV ¹⁷ fL	MCH ¹⁸ pg	MCHC ¹⁹ g/dL	RDW ²⁰ %	PLT ²¹ K/ μ L	MPV ²² fL	Reti ²³	
HR-16	0.1	9.76	15.8	48.7	49.9	16.2	32.5	12.5	567	8.8	2.09	
HR-17	0	9.52	15.4	46.9	49.3	16.1	32.8	13	546	8.6	2.1	
HR-18	0.1	9.94	15.9	48.1	48.4	16	33.1	13.2	700	8.6	2.23	
HR-19	0	10.08	16.1	48.6	48.2	16	33.2	12.9	668	8.6	1.77	
HR-20	0	9.46	15.4	45.4	48	16.2	33.8	13.6	872	5.1	3.09	
N	5	5	5	5	5	5	5	5	5	5	5	

1, White blood cell; 2, Neutrophils; 3, Lymphocyte; 4, Monocyte; 5, Eosinophil; 6, Large unstain cells; 7, Basophil; 8, Percent of neutrophils; 9, Percent of lymphocyte; 10, Percent of monocyte; 11, Percent of eosinophil; 12, Large unstain cells percent; 13, Percent of basophil; 14, Red blood cell; 15, Hemoglobin; 16, Hematocrit; 17, Mean corpuscular volume; 18, Mean corpuscular hemoglobin; 19, Mean corpuscular hemoglobin concentration; 20, Red cell distribution width; 21, Platelet; 22, Mean platelet volume; 23, Reticulocyte

Appendix 14-1. Individual blood coagulation test of male rats in exposure group

INDIVIDUAL BLOODCOAGULATION TEST		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042	GROUP : Control	SEX : MALE
	DOSE : 0 mg/m ³	
ANIMAL	APTT (sec)	PT (sec)
CE-1	20.7	9.15
CE-2	20.5	9.00
CE-3	19.0	9.15
CE-4	19.2	8.85
CE-5	17.4	8.70
CE-6	21.5	9.00
CE-7	21.5	8.55
CE-8	21.8	8.85
CE-9	20.0	8.70
CE-10	19.4	8.40

STUDY ID : GT14-00042	GROUP : Low	SEX : MALE
	DOSE : 0.2 mg/m ³	
ANIMAL	APTT (sec)	PT (sec)
LE-11	20.3	9.00
LE-12	2.01	9.60
LE-13	19.6	9.45
LE-14	18.6	9.15
LE-15	19.6	9.00
LE-16	21.8	8.70
LE-17	23.7	9.15
LE-18	22.0	9.45
LE-19	20.4	8.25
LE-20	18.0	8.85

APTT : activated partial thromboplastin time, PT : prothrombin time

Appendix 14-1. Individual blood coagulation test of male rats in exposure group (continued)

INDIVIDUAL BLOODCOAGULATION TEST		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042	GROUP : Medium DOSE : 0.5 mg/m ³	SEX : MALE
ANIMAL	APTT (sec)	PT (sec)
ME-21	21.8	9.30
ME-22	21.1	8.10
ME-23	20.0	9.60
ME-24	15.8	9.30
ME-25	19.2	9.30
ME-26	-	-
ME-27	20.5	9.15
ME-28	21.1	8.85
ME-29	20.5	9.00
ME-30	17.5	9.45
STUDY ID : GT14-00042	GROUP : High DOSE : 1.0 mg/m ³	SEX : MALE
ANIMAL	APTT (sec)	PT (sec)
HE-31	19.8	9.00
HE-32	20.0	9.00
HE-33	18.6	9.45
HE-34	18.1	9.30
HE-35	19.2	9.00
HE-36	21.6	9.00
HE-37	21.1	8.85
HE-38	20.3	8.70
HE-39	19.4	9.30
HE-40	19.4	9.60

APTT : activated partial thromboplastin time, PT : prothrombin time

Appendix 14-2. Individual blood coagulation test of female rats in exposure group

INDIVIDUAL BLOODCOAGULATION TEST		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042	GROUP : Control	SEX : FEMALE
	DOSE : 0 mg/m ³	
ANIMAL	APTT (sec)	PT (sec)
CE-41	21.8	9.30
CE-42	22.2	9.00
CE-43	22.0	9.00
CE-44	20.4	9.15
CE-45	20.4	8.70
CE-46	21.1	9.55
CE-47	23.5	9.45
CE-48	21.6	9.75
CE-49	20.7	9.60
CE-50	20.1	8.70

STUDY ID : GT14-00042	GROUP : Low	SEX : FEMALE
	DOSE : 0.2 mg/m ³	
ANIMAL	APTT (sec)	PT (sec)
LE-51	22.4	9.15
LE-52	21.1	9.00
LE-53	22.6	9.60
LE-54	21.9	10.10
LE-55	19.4	9.75
LE-56	20.9	8.55
LE-57	20.0	8.85
LE-58	20.5	9.75
LE-59	21.8	8.40
LE-60	17.9	8.55

APTT : activated partial thromboplastin time, PT : prothrombin time

Appendix 14-2. Individual blood coagulation test of female rats in exposure group (continued)

INDIVIDUAL BLOODCOAGULATION TEST		
EXPOSURE 13WEEKS		
STUDY ID : GT14-00042	GROUP : Medium DOSE : 0.5 mg/m ³	SEX : FEMALE
ANIMAL	APTT (sec)	PT (sec)
ME-61	21.1	9.30
ME-62	22.6	10.20
ME-63	23.5	10.60
ME-64	20.1	9.15
ME-65	21.0	8.70
ME-66	22.6	8.85
ME-67	20.9	9.30
ME-68	21.3	9.45
ME-69	23.5	9.60
ME-70	21.9	8.25

STUDY ID : GT14-00042	GROUP : High DOSE : 1.0 mg/m ³	SEX : FEMALE
ANIMAL	APTT (sec)	PT (sec)
HE-71	22.6	8.85
HE-72	20.7	9.15
HE-73	20.9	9.90
HE-74	21.1	9.60
HE-75	20.3	9.75
HE-76	18.8	8.55
HE-77	22.0	9.30
HE-78	24.0	9.15
HE-79	21.0	9.00
HE-80	23.1	10.10

APTT : activated partial thromboplastin time, PT : prothrombin time

Appendix 14-3. Individual blood coagulation test of male rats in recovery group

INDIVIDUAL BLOOD COAGULATION TEST		
RECOVERY 13WEEKS		
STUDY ID : GT14-00042	GROUP : Control	SEX : MALE
	DOSE : 0 mg/m ³	
ANIMAL	APTT (sec)	PT (sec)
CR-1	20.7	7.05
CR-2	18.8	6.60
CR-3	20.0	6.60
CR-4	17.9	6.90
CR-5	18.9	7.50
STUDY ID : GT14-00042	GROUP : Low	SEX : MALE
	DOSE : 0.2 mg/m ³	
ANIMAL	APTT (sec)	PT (sec)
LR-6	20.4	6.90
LR-7	19.8	6.60
LR-8	20.0	6.30
LR-9	17.4	7.80
LR-10	18.5	7.20
STUDY ID : GT14-00042	GROUP : Medium	SEX : MALE
	DOSE : 0.5 mg/m ³	
ANIMAL	APTT (sec)	PT (sec)
MR-11	21.3	7.80
MR-12	20.5	7.80
MR-13	18.5	7.65
MR-14	19.4	7.20
MR-15	18.3	7.65
STUDY ID : GT14-00042	GROUP : High	SEX : MALE
	DOSE : 1.0 mg/m ³	
ANIMAL	APTT (sec)	PT (sec)
HR-16	19.5	7.65
HR-17	19.5	7.65
HR-18	18.5	7.50
HR-19	19.2	7.50
HR-20	17.5	7.50

APTT : activated partial thromboplastin time, PT : prothrombin time

Appendix 15-1. Histopathological findings of male rats in exposure group

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
EXPOSURE 13WEEKS										
STUDY : GT14-00042	SEX : MALE									
GROUP(mg/m ³) : CE(0 mg/m ³)										
ANIMAL ID	1	2	3	4	5	6	7	8	9	10
Liver	-	-	-	-	-	-	-	-	-	-
Kidney	-	-	-	-	-	-	-	-	-	-
-Basophilic tubules, focal, cortex									±	±
Adrenal gl.	-	-	-	-	-	-	-	-	-	-
Urinary bladder	-	-	-	-	-	-	-	-	-	-
Spleen	-	-	-	-	-	-	-	-	-	-
Pancreas	-	-	-	-	-	-	-	-	-	-
Thymus	-	-	-	-	-	-	-	-	-	-
Thyroid	-	-	-	-	-	-	-	-	-	-
Parathyroid	-	-	-	-	-	-	-	-	-	-
Trachea	-	-	-	-	-	-	-	-	-	-
Esophagus	-	-	-	-	-	-	-	-	-	-
Tongue	-	-	-	-	-	-	-	-	-	-
Lung	-	-	-	-	-	-	-	-	-	-
Heart	-	-	-	-	-	-	-	-	-	-
Submandibular LN	-	-	-	-	-	-	-	-	-	-
Mesenteric LN	-	-	-	-	-	-	-	-	-	-
Salivary gl. submandibular	-	-	-	-	-	-	-	-	-	-
Salivary gl. sublingual	-	-	-	-	-	-	-	-	-	-
Salivary gl. parotid	-	-	-	-	-	-	-	-	-	-
Stomach	-	-	-	-	-	-	-	-	-	-
Duodenum	-	-	-	-	-	-	-	-	-	-
Ileum	-	-	-	-	-	-	-	-	-	-
Jejunum	-	-	-	-	-	-	-	-	-	-
Cecum	-	-	-	-	-	-	-	-	-	-
Colon	-	-	-	-	-	-	-	-	-	-
Rectum	-	-	-	-	-	-	-	-	-	-
Skin	-	-	-	-	-	-	-	-	-	-
Mammary gl.	-	-	-	-	-	-	-	-	-	-
Eye	-	-	-	-	-	-	-	-	-	-
Harderian gl.	-	-	-	-	-	-	-	-	-	-
Brain	-	-	-	-	-	-	-	-	-	-
Pituitary	-	-	-	-	-	-	-	-	-	-
-Cyst, pars intermedia	±	±								
Femur	-	-	-	-	-	-	-	-	-	-
Spinal cord	-	-	-	-	-	-	-	-	-	-
Skeletal muscle	-	-	-	-	-	-	-	-	-	-
Sciatic nerve	-	-	-	-	-	-	-	-	-	-
Testis	-	-	-	-	-	-	-	-	-	-
Epididymis	-	-	-	-	-	-	-	-	-	-
Prostate	-	-	-	-	-	-	-	-	-	-
-Inflammation, suppurative									+	
Seminal vesicle	-	-	-	-	-	-	-	-	-	-
Coagulating gl.	-	-	-	-	-	-	-	-	-	-
Sternum	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable, ± : minimal, +: mild
gl.=gland, LN=lymph node

Appendix 15-1. Histopathological findings of male rats in exposure group (continued)

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
EXPOSURE 13WEEKS										
STUDY : GT14-00042	SEX : MALE									
GROUP(mg/m ³) : LE(0.2 mg/m ³)										
ANIMAL ID	11	12	13	14	15	16	17	18	19	20
Lung	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable

Appendix 15-1. Histopathological findings of male rats in exposure group (continued)

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
EXPOSURE 13WEEKS										
STUDY : GT14-00042	SEX : MALE									
GROUP(mg/m ³) : ME(0.5 mg/m ³)										
ANIMAL ID	21	22	23	24	25	26 [#]	27	28	29	30
Liver						±				
-Congestion										
Kidney										
-Mineralization, tubule, focal, cortex						±				
Adrenal gl.						-				
Urinary bladder										
-Flattening, urothelial, with inflammation						++				
Spleen						-				
Pancreas						-				
Thymus						-				
Thyroid						-				
Parathyroid						-				
Trachea						-				
Esophagus						-				
Tongue						-				
Lung		-	-	-	-	-	-	-	-	-
-Inflammation, focal, alveolar, with fibrosis		+								
-Alveolar macrophage, focal						±				
-Congestion						+				
Heart						-				
Submandibular LN						-				
Mesenteric LN						-				
Salivary gl. submandibular						-				
Salivary gl. sublingual						-				
Salivary gl. parotid						-				
Stomach						-				
Duodenum						-				
Ileum						-				
Jejunum						-				
Cecum						-				
Colon						-				
Rectum						-				
Skin						-				
Mammary gl.						-				
Eye						-				
Harderian gl.						-				
Brain						-				
Pituitary						-				
Femur						-				
Spinal cord						-				
Skeletal muscle						-				
Sciatic nerve						-				
Testis						-				
Epididymis						-				
Prostate						-				
-Edema/hemorrhage, with inflammation, interstitial						+				

Grade) -: Not remarkable, ±: minimal, +: mild, ++: moderate

gl.=gland, LN=lymph node, #: not scheduled (dead animal on 81 day after test article exposure)

Appendix 15-1. Histopathological findings of male rats in exposure group (continued)

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
EXPOSURE 13WEEKS										
STUDY : GT14-00042	SEX : MALE									
GROUP(mg/m ³) : ME(0.5 mg/m ³)										
ANIMAL ID	21	22	23	24	25	26 [#]	27	28	29	30
Seminal vesicle						-				
Coagulating gl.						-				
Sternum						-				
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable

gl.=gland, LN=lymph node, #: not scheduled (dead animal on 81 day after test article exposure)

Appendix 15-1. Histopathological findings of male rats in exposure group (continued)

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS EXPOSURE 13WEEKS										
STUDY : GT14-00042	SEX : MALE									
GROUP(mg/m ³) : HE(1.0 mg/m ³)	31	32	33	34	35	36	37	38	39	40
ANIMAL ID										
Liver	-	-	-	-	-	-	-	-	-	-
Kidney	-	-	-	-	-	-	-	-	-	-
-Basophilic tubules, focal, cortex		±							±	
Adrenal gl.	-	-	-	-	-	-	-	-	-	-
Urinary bladder	-	-	-	-	-	-	-	-	-	-
Spleen	-	-	-	-	-	-	-	-	-	-
Pancreas	-	-	-	-	-	-	-	-	-	-
Thymus	-	-	-	-	-	-	-	-	-	-
Thyroid	-	-	-	-	-	-	-	-	-	-
Parathyroid	-	-	-	-	-	-	-	-	-	-
Trachea	-	-	-	-	-	-	-	-	-	-
Esophagus	-	-	-	-	-	-	-	-	-	-
Tongue	-	-	-	-	-	-	-	-	-	-
Lung	-	-	-	-	-	-	-	-	-	-
-Hemorrhage, focal, alveolar			±							
Heart	-	-	-	-	-	-	-	-	-	-
Submandibular LN	-	-	-	-	-	-	-	-	-	-
Mesenteric LN	-	-	-	-	-	-	-	-	-	-
Salivary gl. submandibular	-	-	-	-	-	-	-	-	-	-
Salivary gl. sublingual	-	-	-	-	-	-	-	-	-	-
Salivary gl. parotid	-	-	-	-	-	-	-	-	-	-
Stomach	-	-	-	-	-	-	-	-	-	-
Duodenum	-	-	-	-	-	-	-	-	-	-
Ileum	-	-	-	-	-	-	-	-	-	-
Jejunum	-	-	-	-	-	-	-	-	-	-
Cecum	-	-	-	-	-	-	-	-	-	-
Colon	-	-	-	-	-	-	-	-	-	-
Rectum	-	-	-	-	-	-	-	-	-	-
Skin	-	-	-	-	-	-	-	-	-	-
Mammary gl.	-	-	-	-	-	-	-	-	-	-
Eye	-	-	-	-	-	-	-	-	-	-
Harderian gl.	-	-	-	-	-	-	-	-	-	-
Brain	-	-	-	-	-	-	-	-	-	-
Pituitary	-	-	-	-	-	-	-	-	-	-
Femur	-	-	-	-	-	-	-	-	-	-
Spinal cord	-	-	o	-	-	-	-	-	-	-
Skeletal muscle	-	-	-	-	-	-	-	-	-	-
Sciatic nerve	-	-	-	-	-	-	-	-	-	-
Testis	-	-	-	-	-	-	-	-	-	-
Epididymis	-	-	-	-	-	-	-	-	-	-
Prostate	-	-	-	-	-	-	-	-	-	-
Seminal vesicle	-	-	-	-	-	-	-	-	-	-
Coagulating gl.	-	-	-	-	-	-	-	-	-	-
Sternum	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable, ±: minimal

gl.=gland, LN=lymph node, o: organ omission

Appendix 15-2. Histopathological findings of female rats in exposure group

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
EXPOSURE 13WEEKS										
STUDY : GT14-00042	SEX : FEMALE									
GROUP(mg/m ³) : CE(0 mg/m ³)										
ANIMAL ID	41	42	43	44	45	46	47	48	49	50
Liver	-	-	-	-	-	-	-	-	-	-
Kidney	-	-	-	-	-	-	-	-	-	-
Adrenal gl.	-	-	-	-	-	-	-	-	-	-
Urinary bladder	-	-	-	-	-	-	-	-	-	-
Spleen	-	-	-	-	-	-	-	-	-	-
Pancreas	-	-	-	-	-	-	-	-	-	-
Thymus	-	-	-	-	-	-	-	-	-	-
Thyroid	-	-	-	-	-	-	-	-	-	-
Parathyroid	-	-	-	-	-	-	-	-	o	-
Trachea	-	-	-	-	-	-	-	-	-	-
Esophagus	-	-	-	-	-	-	-	-	-	-
Tongue	-	-	-	-	-	-	-	-	-	-
Lung	-	-	-	-	-	-	-	-	-	-
Heart	-									
Submandibular LN	-	-	-	-	-	-	-	-	-	-
Mesenteric LN	-	-	-	-	-	-	-	-	-	-
Salivary gl. submandibular	-	-	-	-	-	-	-	-	-	-
Salivary gl. sublingual	-	-	-	-	-	-	-	-	-	-
Salivary gl. parotid	-	-	-	-	-	-	-	-	-	-
Stomach	-	-	-	-	-	-	-	-	-	-
Duodenum	-	-	-	-	-	-	-	-	-	-
Ileum	-	-	-	-	-	-	-	-	-	-
Jejunum	-	-	-	-	-	-	-	-	-	-
Cecum	-	-	-	-	-	-	-	-	-	-
Colon	-	-	-	-	-	-	-	-	-	-
Rectum	-	-	-	-	-	-	-	-	-	-
Skin	-	-	-	-	-	-	-	-	-	-
Mammary gl.	-	-	-	-	-	-	-	-	-	-
Eye	-	-	-	-	-	-	-	-	-	-
Harderian gl.	-	-	-	-	-	-	-	-	-	-
Brain	-	-	-	-	-	-	-	-	-	-
Pituitary	-	-	-	-	-	-	-	-	-	-
-Cyst, pars intermedia	±									
Femur	-	-	-	-	-	-	-	-	-	-
Spinal cord	-	-	-	-	-	-	-	-	-	-
Skeletal muscle	-	-	-	-	-	-	-	-	-	-
Sciatic nerve	-	-	-	-	-	-	-	-	-	-
Ovary	-	-	-	-	-	-	-	-	-	-
Uterus	-	-	-	-	-	-	-	-	-	-
Vagina	-	-	-	-	-	-	-	-	-	-
Sternum	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable, ±: minimal

gl=gland, LN=lymph node, o: organ omission

Appendix 15-2. Histopathological findings of female rats in exposure group (continued)

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
EXPOSURE 13WEEKS										
STUDY : GT14-00042	SEX : FEMALE									
GROUP(mg/m ³) : LE(0.2 mg/m ³)										
ANIMAL ID	51	52	53	54	55	56	57	58	59	60
Lung	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable

Appendix 15-2. Histopathological findings of female rats in exposure group (continued)

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
EXPOSURE 13WEEKS										
STUDY : GT14-00042	SEX : FEMALE									
GROUP(mg/m ³) : ME(0.5 mg/m ³)										
ANIMAL ID	61	62	63	64	65	66	67	68	69	70
Lung	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable

Appendix 15-2. Histopathological findings of female rats in exposure group (continued)

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
EXPOSURE 13WEEKS										
STUDY : GT14-00042										
GROUP(mg/m ³) : HE(1.0 mg/m ³)										
ANIMAL ID	71	72	73	74	75	76	77	78	79	80
Liver	-	-	-	-	-	-	-	-	-	-
-Degeneration/necrosis, focal					±					
Kidney	-	-	-	-	-	-	-	-	-	-
Adrenal gl.	-	-	-	-	-	-	-	-	-	-
Urinary bladder	-	-	-	-	-	-	-	-	-	-
Spleen	-	-	-	-	-	-	-	-	-	-
Pancreas	-	-	-	-	-	-	-	-	-	-
Thymus	-	-	-	-	-	-	-	-	-	-
Thyroid	-	-	-	-	-	-	-	-	-	-
Parathyroid	-	-	-	-	-	-	-	-	-	-
Trachea	-	-	-	-	-	-	-	-	-	-
Esophagus	-	-	-	-	-	-	-	-	-	-
Tongue	-	-	-	-	-	-	-	-	-	-
Lung	-	-	-	-	-	-	-	-	-	-
Heart	-									
Submandibular LN	-	-	-	-	-	-	-	-	-	-
Mesenteric LN	-	-	-	-	-	-	-	-	-	-
Salivary gl. submandibular	-	-	-	-	-	-	-	-	-	-
Salivary gl. sublingual	-	-	-	-	-	-	-	-	-	-
Salivary gl. parotid	-	-	-	-	-	-	-	-	-	-
Stomach	-	-	-	-	-	-	-	-	-	-
Duodenum	-	-	-	-	-	-	-	-	-	-
Ileum	-	-	-	-	-	-	-	-	-	-
Jejunum	-	-	-	-	-	-	-	-	-	-
Cecum	-	-	-	-	-	-	-	-	-	-
Colon	-	-	-	-	-	-	-	-	-	-
Rectum	-	-	-	-	-	-	-	-	-	-
Skin	-	-	-	-	-	-	-	-	-	-
Mammary gl.	-	-	-	-	-	-	-	-	-	-
Eye	-	-	-	-	-	-	-	-	-	-
Harderian gl.	-	-	-	-	-	-	-	-	-	-
-Cell infiltration, mononuclear, focal								±		
Brain	-	-	-	-	-	-	-	-	-	-
Pituitary	-	-	-	-	-	-	-	-	-	-
-Cyst, pars intermedia										
Femur	-	-	-	-	-	-	-	-	-	-
Spinal cord	-	-	-	-	-	-	-	-	-	-
Skeletal muscle	-	-	-	-	-	-	-	-	-	-
Sciatic nerve	-	-	-	-	-	-	-	-	-	-
Ovary	-	-	-	-	-	-	-	-	-	-
Uterus	-	-	-	-	-	-	-	-	-	-
Vagina	-	-	-	-	-	-	-	-	-	-
Sternum	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable, ±: minimal

gl=gland, LN=lymph node

Appendix 15-3. Histopathological findings of male rats in recovery group

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS										
RECOVERY 13WEEKS										
STUDY : GT14-00042					SEX : MALE					
GROUP :					CR(0 mg/m³)					
ANIMAL ID	1	2	3	4	5	6	7	8	9	10
Liver	-	-	-	-	-					
Kidney										
-Basophilic tubules, focal, cortex	±	±	±	±	±					
-Hyaline droplet, inner stripe										
Adrenal gl.	-	-	-	-	-					
Urinary bladder	-	-	-	-	-					
Spleen	-	-	-	-	-					
Pancreas	-	-	-	-	-					
Thymus	-	-	-	-	-					
Thyroid	-	-	-	-	-					
Parathyroid	-	-	-	-	-					
Trachea	-	-	-	-	-					
Esophagus	-	-	-	-	-					
Tongue	-	-	-	-	-					
Lung	-	-	-	-	-	-	-	-	-	-
Heart	-	-	-	-	-					
Submandibular LN	-	-	-	-	-					
Mesenteric LN	-	-	-	-	-					
Salivary gl. submandibular	-	-	-	-	-					
Salivary gl. sublingual	-	-	-	-	-					
Salivary gl. parotid	-	-	-	-	-					
Stomach	-	-	-	-	-					
Duodenum	-	-	-	-	-					
Ileum	-	-	-	-	-					
Jejunum	-	-	-	-	-					
Cecum	-	-	-	-	-					
Colon	-	-	-	-	-					
Rectum	-	-	-	-	-					
Skin	-	-	-	-	-					
Mammary gl.	-	-	-	-	-					
Eye	-	-	-	-	-					
Harderian gl.	-	-	-	-	-					
-Cell infiltration, lymphocytic, focal, interstitial					±					
Brain	-	-	-	-	-					
Pituitary	-	-	-	-	-					
Femur	-	-	-	-	-					
Spinal cord	-	-	-	-	-					
Skeletal muscle	-	-	-	-	-					
Sciatic nerve	-	-	-	-	-					
Testis	-	-	-	-	-					
-Atrophy, seminiferous, unilateral										++
Epididymis	-	-	-	-	-					
-Hypoplasia/degeneration, epididymal duct, unilateral										+
-Decreased, spermatozoa, in lumen, unilateral										+
Prostate	-	-	-	-	-					
Seminal vesicle	-	-	-	-	-					
Coagulating gl.	-	-	-	-	-					
Sternum	-	-	-	-	-					
Nasal cavity	-	-	-	-	-	-	-	-	-	-

(Grade) -: Not remarkable, ±: minimal, +: mild, ++: moderate
gl.=gland, LN=lymph node

Appendix 15-3. Histopathological findings of male rats in recovery group (continued)

INDIVIDUAL DATA OF HISTOPATHOLOGICAL FINDINGS RECOVERY 13WEEKS										
STUDY : GT14-00042					SEX : MALE					
GROUP :	MR(0.5 mg/m³)					HR(1.0 mg/m³)				
ANIMAL ID	11	12	13	14	15	16	17	18	19	20
Liver	-	-	-	-	-	-	-	-	-	-
Kidney						±	±	±	±	±
-Basophilic tubules, focal, cortex						±				
-Cell infiltration, mononuclear, perivasculare						±				
-Hyaline droplet, inner stripe and cortex										±
Adrenal gl.	-	-	-	-	-	-	-	-	-	-
Urinary bladder	-	-	-	-	-	-	-	-	-	-
Spleen	-	-	-	-	-	-	-	-	-	-
Pancreas	-	-	-	-	-	-	-	-	-	-
Thymus	-	-	-	-	-	-	-	-	-	-
Thyroid	-	-	-	-	-	-	-	-	-	-
Parathyroid	-	-	-	-	-	-	-	-	-	-
Trachea	-	-	-	-	-	-	-	-	-	-
Esophagus	-	-	-	-	-	-	-	-	-	-
Tongue	-	-	-	-	-	-	-	-	-	-
Lung	-	-	±	±	-	-	-	-	-	-
-Alveolar macrophage, focal										
Heart	-	-	-	-	-	-	-	-	-	-
Submandibular LN	-	-	-	-	-	-	-	-	-	-
Mesenteric LN	-	-	-	-	-	-	-	-	-	-
Salivary gl. submandibular	-	-	-	-	-	-	-	-	-	-
Salivary gl. sublingual	-	-	-	-	-	-	-	-	-	-
Salivary gl. parotid	-	-	-	-	-	-	-	-	-	-
Stomach	-	-	-	-	-	-	-	-	-	-
Duodenum	-	-	-	-	-	-	-	-	-	-
Ileum	-	-	-	-	-	-	-	-	-	-
Jejunum	-	-	-	-	-	-	-	-	-	-
Cecum	-	-	-	-	-	-	-	-	-	-
Colon	-	-	-	-	-	-	-	-	-	-
Rectum	-	-	-	-	-	-	-	-	-	-
Skin	-	-	-	-	-	-	-	-	-	-
Mammary gl.	-	-	-	-	-	-	-	-	-	-
Eye	-	-	-	-	-	-	-	-	-	-
Harderian gl.	-	-	-	-	-	-	-	-	-	-
Brain	-	-	-	-	-	-	-	-	-	-
Pituitary	-	-	-	-	-	-	-	-	-	-
Femur	-	-	-	-	-	-	-	-	-	-
Spinal cord	-	-	-	-	-	-	-	-	-	-
Skeletal muscle	-	-	-	-	-	-	-	-	-	-
Sciatic nerve	-	-	-	-	-	-	-	-	-	-
Testis	-	-	-	-	-	-	-	-	-	-
Epididymis	-	-	-	-	-	-	-	-	-	-
Prostate	-	-	-	-	-	-	-	-	-	-
Seminal vesicle	-	-	-	-	-	-	-	-	-	-
Coagulating gl.	-	-	-	-	-	-	-	-	-	-
Sternum	-	-	-	-	-	-	-	-	-	-
Nasal cavity	-	-	-	-	-	-	-	-	-	-

Grade) -: Not remarkable, ±: minimal

gl.=gland, LN=lymph node

Appendix 16-1. Individual bronchoalveolar labage analysis of male rats in exposure group

INDIVIDUAL BRONCHOALVEOLAR LABAGE ANALYSIS							
EXPOSURE 13WEEKS							
SEX : MALE							
STUDY ID : GT14-00042		GROUP : Control					
		DOSE : 0 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
CE-1	14	7.7	17.2	0.75	96.5	0.015	0.01125
CE-2	7	14.4	14.6	1.11	96.0	0.01665	0.02775
CE-3	8	4.0	11.9	0.88	97.0	0.0176	0.0088
CE-4	11	2.0	14	1.23	95.0	0.0492	0.0123
CE-5	10	3.1	14.1	0.84	92.5	0.0462	0.0168
SEX : MALE							
STUDY ID : GT14-00042		GROUP : Low					
		DOSE : 0.2 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
LE-11	13	3.0	11.4	1	0.925	0.04	0.035
LE-12	12	2.3	13.6	1.01	0.95445	0.03535	0.0202
LE-13	12	1.5	15	1.38	1.311	0.0414	0.0276
LE-14	11	5.7	12.5	0.73	0.68255	0.0365	0.01095
LE-15	8	7.9	14.5	0.68	0.646	0.0204	0.0136
SEX : MALE							
STUDY ID : GT14-00042		GROUP : Medium					
		DOSE : 0.5 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
ME-21	12	2.0	11.2	1.05	0.9345	0.063	0.0525
ME-22	12	2.6	14.7	0.94	0.8742	0.0423	0.0235
ME-23	14	3.4	15.4	0.94	0.8977	0.0188	0.0235
ME-24	6	0.4	9.7	0.77	0.7238	0.02695	0.01925
ME-25	11	4.2	16.8	0.85	0.76925	0.0255	0.05525
SEX : MALE							
STUDY ID : GT14-00042		GROUP : High					
		DOSE : 1.0 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
HE-31	13	1.8	13.1	1.05	0.966	0.063	0.021
HE-32	12	4.7	13.9	1.03	0.93215	0.0309	0.06695
HE-33	8	7.6	12.7	0.95	0.8835	0.038	0.0285
HE-34	9	4.3	18	1.07	1.02185	0.0214	0.02675
HE-35	9	2.0	11	0.73	0.67525	0.04015	0.0146

1, Total protein; 2, Albumin; 3, Polymorphonuclear cell

Appendix 16-2. Individual bronchoalveolar lavage analysis of female rats in exposure group

INDIVIDUAL BRONCHOALVEOLAR LABAGE ANALYSIS							
EXPOSURE 13WEEKS							
SEX : FEMALE							
STUDY ID : GT14-00042		GROUP : Control					
		DOSE : 0 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
CE-41	23	5.9	20.2	0.48	0.4632	0.0096	0.0072
CE-42	14	2.5	13.7	0.61	0.5856	0.00915	0.01525
CE-43	12	1.0	10.9	0.73	0.7081	0.0146	0.0073
CE-44	18	2.1	11.3	0.72	0.6948	0.018	0.0072
CE-45	18	2.4	14.1	0.63	0.58905	0.0189	0.02205
SEX : FEMALE							
STUDY ID : GT14-00042		GROUP : Low					
		DOSE : 0.2 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
LE-51	10	1.6	11.8	0.58	0.5539	0.0058	0.0203
LE-52	16	0.7	9.8	0.49	0.45815	0.02205	0.0098
LE-53	18	1.7	12.7	0.53	0.5035	0.0159	0.0106
LE-54	14	2.5	12.9	0.67	0.63315	0.0268	0.01005
LE-55	25	2.0	12.7	0.68	0.646	0.0204	0.0136
SEX : FEMALE							
STUDY ID : GT14-00042		GROUP : Medium					
		DOSE : 0.5 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
ME-61	14	2.5	12.9	0.57	0.5301	0.0285	0.0114
ME-62	21	33.0	86.8	0.53	0.4929	0.02385	0.01325
ME-63	18	0.1	15.3	0.53	0.50615	0.0106	0.01325
ME-64	23	2.8	16.5	0.65	0.60775	0.0195	0.02275
ME-65	15	1.0	14.7	0.65	0.62075	0.02925	0
SEX : FEMALE							
STUDY ID : GT14-00042		GROUP : High					
		DOSE : 1.0 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
HE-71	15	0.5	11.2	0.39	0.3627	0.0234	0.0039
HE-72	25	11.7	38.7	0.78	0.7527	0.0195	0.0078
HE-73	19	2.2	14.1	0.66	0.6138	0.033	0.0132
HE-74	21	17.0	17.4	0.55	0.51975	0.022	0.00825
HE-75	20	8.4	12	0.55	0.5225	0.0165	0.011

1, Total protein; 2, Albumin; 3, Polymorphonuclear cell

Appendix 16-3. Individual bronchoalveolar labage analysis of male rats in recovery group

INDIVIDUAL BRONCHOALVEOLAR LABAGE ANALYSIS							
RECOVERY 13WEEKS							
SEX : FEMALE							
STUDY ID : GT14-00042		GROUP : Control					
		DOSE : 0 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
CR-1	21	0.4	13.2	0.65	0.6175	0.0228	0.0098
CR-2	14	2	4.8	0.47	0.4536	0.0118	0.0047
CR-3	11	0.9	4.6	0.53	0.5035	0.0265	0.0000
CR-4	14	0.3	2.6	1.25	1.1813	0.0688	0.0000
CR-5	10	2.1	4.7	1.47	1.3598	0.0882	0.0221
SEX : FEMALE							
STUDY ID : GT14-00042		GROUP : Low					
		DOSE : 0.2 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
LR-1	7	1	4.6	0.13	0.1261	0.0039	0.0000
LR-2	9	0.2	4.7	0.59	0.5576	0.0207	0.0118
LR-3	11	1.2	5.4	0.82	0.7790	0.0246	0.0164
LR-4	14	2.7	4.7	0.74	0.6919	0.0370	0.0111
LR-5	10	9	4.2	0.84	0.7980	0.0252	0.0168
SEX : FEMALE							
STUDY ID : GT14-00042		GROUP : Medium					
		DOSE : 0.5 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
MR-1	10	0.9	3.1	0.23	0.2197	0.0069	0.0035
MR-2	8	0.2	3.4	0.19	0.1815	0.0067	0.0019
MR-3	18	6	5.7	0.49	0.4753	0.0049	0.0098
MR-4	44	2.6	5.7	0.92	0.8740	0.0322	0.0138
MR-5	7	0.8	3.1	0.68	0.6562	0.0170	0.0068
SEX : FEMALE							
STUDY ID : GT14-00042		GROUP : High					
		DOSE : 1.0 mg/m ³					
ANIMAL ID	LDH	m-TP ¹	m-ALB ²	Total cell	Macro phage	PMN ³	Lymphocyte
	mg/dL	mg/dL	IU/L	×10 ³ µL	×10 ³ µL	×10 ³ µL	×10 ³ µL
HR-1	8	0.1	1.5	0.26	0.2457	0.0052	0.0091
HR-2	7	0.9	2.8	0.28	0.2702	0.0042	0.0056
HR-3	15	0.4	3.7	0.44	0.4158	0.0176	0.0066
HR-4	6	0.7	2.7	0.50	0.4775	0.0100	0.0125
HR-5	9	0.5	3.5	0.56	0.5180	0.0308	0.0112

1, Total protein; 2, Albumin; 3, Polymorphonuclear cell

10. ANNEXES

Annex 1. Test substance data sheet



Annex 2. Animals diagnostic report

HEALTH MONITORING REPORT

January 21, 2014

Productive facility Strain	Inassa (SPF rats)												Inassa (SPF mice)												
	SLC:SD			SLC:WistarST			F344/INSLIC			LEW/SANSLC			SHIRAKAWA			WKY/DM			SLC:DA			SLC:CR			
Sacrificed day Test	12 / 24			12 / 25			12 / 19			12 / 19			12 / 23			12 / 23			12 / 23			12 / 25			
Age and number of tested animals	a	b	c, d	a	b	c, d	a	b	c, d	a	b	c, d	s	b	c, d	a	b	c, d	a	b	c, d	a	b	c, d	
16MS	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	Re	
Pseudomonas aeruginosa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Citrobacter rodentium																									
Salmonella spp.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stenotrophomonas maltophilia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flavimurula pneumoniae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bordetella bronchiseptica	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Streptococcus pneumoniae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Corynebacterium kutscheri	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clostridium perfringens	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CAR bacillus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Helicobacter hepaticus																									
Helicobacter pullorum																									
Mycoplasma pneumoniae	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mouse hepatitis virus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sindbis virus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Influenza virus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pneumonia virus of mice																									
Lymphocytic choriomeningitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mouse adenovirus																									
Enteromelia virus																									
Murina norovirus																									
Primate rotavirus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intestinal protozoa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Endoparasites	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dermatophytes																									

Remarks : a = Bacteriology and Parasitology

b = Serology (CF or Aggl.)

c = Serology (ELA or IFA)

d = RT-nested PCR method

Re = Reared breeders

(Number of Positive)

Japan SLC, Inc

*S.Takagi*Shouhei Takagi, D.V.M.
Director, Department of
Laboratory Animal Medicine

Annex 2. Animals diagnostic report (continued)

CERTIFICATE OF STRAIN

We hereby certify the strain of the animals and their background as follows

Place of birth :	Japan SLC, Inc. Inasa Production Facility		
Purchaser :	January 10, 2013		
Shipping date and flight number :	As attached sheet		

Details:

	GK/Slc	F344/NSlc	Inbred Rat	HWY/Slc	LEW/SsNSlc
Origin & History	Tohoku University School of Medicine ⇒ 1999, SLC (F?) 2012, (F7+31)	NIH ⇒ ?, Jms ⇒ 1980, SLC (F138) 2012, (F138+70)	Yagi Memorial Park, Japan ⇒ 1993, SLC	NIH ⇒ 1994, SLC (F94) 2012, (F94+36)	

Japan SLC, Inc.

S. Takagi
 Shouhei Takagi, D.V.M.
 Director, Department of
 Laboratory Animal Medicine

Annex 2. Animals diagnostic report (continued)

Genetic profiles for biochemical markers of inbred rat strains

- July, 2012 to December, 2012 -

Strain		Chromosome No.	1	2	3	3	5	8	13	14	19	19	19	19	19
	Locus	Hbb	AmpI	Cat	HaoI	Pgd	GckI	Fh	Gc	E3I	E52	E53	E54		
ACI/NsIC	b	b	a	a	b	a	b	a	b	a	a	a	b		
BNSsNsIC	a	b	a	b	b	b	a	a	a	c	d	b			
DA/SIC	b	a	a	a	a	b	a	b	a	a	a	b			
DRE/Fis	b	b	a	a	b	a	b	a	a	b	d	c	b		
DISBis	b	a	a	a	b	a	b	a	b	d	c	b			
EHBR/Eis	b	a	a	a	b	a	b	a	c	d	c	b			
F344NsIC	a	a	a	a	b	a	b	a	a	a	a	a	b		
GK/SIC	a	a	a	a	a	a	b	a	a	d	c	b			
HWY/SIC	b	a	a	a	b	a	b	a	a	a	a	a	b		
LEW/SsNsIC	b	a	a	a	b	a	a	a	a	a	d	d	b		
WBN/KobSIC	a	a	a	a	b	a	b	a	a	a	a	a	b		
WKAH/HkmSIC	b	a	b	a	b	a	b	a	a	a	a	a	b		



Norio Masui, Ph.D.
Deputy General Manager, Quality Control Department
Biotechnical Center, Japan SLC, Inc.

Annex 3. Certification of Environment for animal care room

Certification of Environment for animal breeding room																											
Study No.	GT14-00042																										
Title	Subchronic Inhalation Toxicity : 90-Day Study of MWCNT in Fisher 344 rats(Acclimation period)																										
SPF Room No.	Inhalation toxicity animal room																										
Period of animal Breeding	2014-02-06 ~ 2014-02-12																										
Breeding environment condition																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Section</th> <th style="width: 25%;">Range of SOP</th> <th style="width: 25%;">Survey value</th> <th style="width: 25%;">Remark</th> </tr> </thead> <tbody> <tr> <td>Temperature</td> <td>22±3 °C</td> <td>21.7±0.4 °C</td> <td></td> </tr> <tr> <td>Humidity</td> <td>50±20 %RH</td> <td>43.9±1.7% RH</td> <td></td> </tr> <tr> <td>Luminous intensity</td> <td>150~300 Lux</td> <td>278 Lux</td> <td></td> </tr> <tr> <td>Noise</td> <td>60 db less than</td> <td>54.7 dB</td> <td></td> </tr> <tr> <td>Ammonia</td> <td>15 ppm less than</td> <td>5 ppm less than</td> <td></td> </tr> </tbody> </table>				Section	Range of SOP	Survey value	Remark	Temperature	22±3 °C	21.7±0.4 °C		Humidity	50±20 %RH	43.9±1.7% RH		Luminous intensity	150~300 Lux	278 Lux		Noise	60 db less than	54.7 dB		Ammonia	15 ppm less than	5 ppm less than	
Section	Range of SOP	Survey value	Remark																								
Temperature	22±3 °C	21.7±0.4 °C																									
Humidity	50±20 %RH	43.9±1.7% RH																									
Luminous intensity	150~300 Lux	278 Lux																									
Noise	60 db less than	54.7 dB																									
Ammonia	15 ppm less than	5 ppm less than																									
<p>It is authenticated that there is no change of environment which digresses from the above established value for more than 2 hours during the test period.</p>																											
Facility management director		Dong-Seok Beck																									
		 (sign)																									
2014-11-07																											

Annex 3. Certification of Environment for animal care room (continued)

Certification of Environment for animal breeding room

Study No.	GT14-00042
Title	Subchronic Inhalation Toxicity : 90-Day Study of MWCNT in Fisher 344 rats(Exposure period)
SPF Room No.	Inhalation toxicity animal room
Period of animal Breeding	2014-02-11 ~ 2014-05-15

Breeding environment condition

Section	Range of SOP	Survey value	Remark
Temperature	22±3 °C	21.6±1.1 °C	
Humidity	50±20 %RH	49.5±7.3% RH	
Luminous intensity	150~300 Lux	285 Lux	
Noise	60 db less than	55.6 dB	
Ammonia	15 ppm less than	5 ppm less than	

It is authenticated that there is no change of environment which digresses from the above established value for more than 2 hours during the test period.

Facility management director Dong-Seok Beck



2014-11-07

Annex 3. Certification of Environment for animal care room (continued)

Certification of Environment for animal breeding room

Study No.	GT14-00042
Title	Subchronic Inhalation Toxicity : 90-Day Study of MWCNT in Fisher 344 rats(Recovery period)
SPF Room No.	Inhalation toxicity animal room
Period of animal Breeding	2014-05-14 ~ 2014-08-12

Breeding environment condition

Section	Range of SOP	Survey value	Remark
Temperature	22±3 °C	21.5±0.7 °C	
Humidity	50±20 %RH	56.5±2.8% RH	
Luminous intensity	150~300 Lux	275 Lux	
Noise	60 db less than	54.6 dB	
Ammonia	15 ppm less than	5 ppm less than	

It is authenticated that there is no change of environment which digresses from the above established value for more than 2 hours during the test period.

Facility management director Dong-Seok Beck 
(sign)

2014-11-07

Annex 4. Laboratory animal diet certification report

Laboratory Diet Certification Report

Teklad Certified Irradiated Global 18% Protein Rodent Diet

2918C



Lot Number 2918C-012914MA

Date of Manufacture 01/29/14

Report Date 02/27/14

The following data is a consolidation of results obtained from one or more independent testing laboratories. The actual laboratory results are available upon request.

Kurt Schaefer
Quality Assurance Coordinator, Teklad Diet
Research Models and Services,
Harlan Laboratories, Inc.

I have reviewed this document.
2014.02.27 10:10:42
-06'00'

Proximate Analysis

Analysis	Result (%)
Protein	17.40
Fat	5.82
Fiber	3.08
Molature	12.82
Ash	5.38
Calcium	1.00
Phosphorus	0.78

Feed Contaminant Screen

Analysis	Result	Units	Established Maximum Concentration
Heavy Metals			
Arsenic	< 0.10	ppm	1.00
Cadmium	< 0.10	ppm	0.50
Lead	< 0.20	ppm	1.50
Mercury	< 0.05	ppm	0.20
Selenium	0.26	ppm	0.50
Mycotoxin			
Aflatoxin B1, B2, G1, G2	< 5.00	ppb	5.00
Chlorinated Hydrocarbons			
Aldrin	< 0.01	ppm	0.03
Lindane	< 0.01	ppm	0.05
Chlordane	< 0.01	ppm	0.05
DDT & related substances	< 0.03	ppm	0.15
Dieldrin	< 0.02	ppm	0.03
Endrin	< 0.02	ppm	0.03
Heptachlor	< 0.01	ppm	0.03
Heptachlor Epoxide	< 0.01	ppm	0.03
Toxaphene	< 0.10	ppm	0.15
PCB's	< 0.10	ppm	0.15
a-BHC	< 0.01	ppm	0.05
b-BHC	< 0.01	ppm	0.05
d-BHC	< 0.01	ppm	0.05
Hexachlorobenzene	< 0.01	ppm	0.03
Mirex	< 0.01	ppm	0.02
Methoxychlor	< 0.05	ppm	0.50
Organophosphates			
Thimet	< 0.15	ppm	0.50
Diazinon	< 0.14	ppm	0.50
Disulfoton	< 0.15	ppm	0.50
Methyl Parathion	< 0.14	ppm	0.50
Malathion	< 0.14	ppm	0.50
Parathion	< 0.12	ppm	0.50
Thiodan	< 0.02	ppm	0.50
Ethion	< 0.14	ppm	0.50
Tritlon	< 0.15	ppm	0.50

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Annex 4. Laboratory animal diet certification report (continued)

Laboratory Diet Certification Report**Teklad Certified Irradiated Global 18% Protein Rodent Diet****2918C**Lot Number **2918C-082513MA**Date of Manufacture **08/25/13**Report Date **09/10/13**

The following data is a consolidation of results obtained from one or more independent testing laboratories. The actual laboratory results are available upon request.

Kurt Schaefer
Quality Assurance Coordinator, Technical Services
Harlan Laboratories, Inc.

I have reviewed this document
2013.09.11 06:51:52
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Proximate Analysis

Analysis	Result (%)
Protein	18.60
Fat	6.08
Fiber	3.28
Moisture	11.10
Ash	6.20
Calcium	0.84
Phosphorus	0.71

Feed Contaminant Screen

Analysis	Result	Units	Established Maximum Concentration
Heavy Metals			
Arsenic	0.14	ppm	1.00
Cadmium	< 0.10	ppm	0.50
Lead	< 0.20	ppm	1.50
Mercury	< 0.05	ppm	0.20
Selenium	0.30	ppm	0.50
Mycotoxin			
Aflatoxin B1, B2, G1, G2	< 5.00	ppb	5.00
Chlorinated Hydrocarbons			
Aldrin	< 0.01	ppm	0.03
Lindane	< 0.01	ppm	0.05
Chlordane	< 0.01	ppm	0.05
DDT & related substances	< 0.03	ppm	0.15
Dieldrin	< 0.02	ppm	0.03
Erodrin	< 0.02	ppm	0.03
Heptachlor	< 0.01	ppm	0.03
Heptachlor Epoxide	< 0.01	ppm	0.03
Toxaphene	< 0.10	ppm	0.15
PCB's	< 0.10	ppm	0.15
a-BHC	< 0.01	ppm	0.05
b-BHC	< 0.01	ppm	0.05
d-BHC	< 0.01	ppm	0.05
Hexachlorobenzene	< 0.01	ppm	0.03
Mirex	< 0.01	ppm	0.02
Methoxychlor	< 0.05	ppm	0.50
Organophosphates			
Thimet	< 0.15	ppm	0.50
Diaznon	< 0.14	ppm	0.50
Disulfoton	< 0.15	ppm	0.50
Methyl Parathion	< 0.14	ppm	0.50
Malathion	< 0.14	ppm	0.50
Parathion	< 0.12	ppm	0.50
Thiodan	< 0.02	ppm	0.50
Ethion	< 0.14	ppm	0.50
Tritlon	< 0.15	ppm	0.50

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Annex 4. Laboratory animal diet certification report (continued)

Laboratory Diet Certification Report

Teklad Certified Irradiated Global 18% Protein Rodent Diet

2918C



Lot Number **2918C-120113MA**

Date of Manufacture **12/01/13**

Report Date **12/17/13**

The following data is a consolidation of results obtained from one or more independent testing laboratories. The actual laboratory results are available upon request.

Kurt Schaefer
Kurt Schaefer
Quality Assurance Coordinator, Teklad Data
Research Models and Services
Harlan Laboratories, Inc.

I have reviewed this
document
2013.12.17 09:56:18
-06'00'

Proximate Analysis

Analysis	Result (%)
Protein	18.10
Fat	5.77
Fiber	2.88
Moisture	12.70
Ash	5.18
Calcium	1.00
Phosphorus	0.88

Feed Contaminant Screen

Analysis	Result	Units	Established Maximum Concentration
Heavy Metals			
Arsenic	0.15	ppm	1.00
Cadmium	< 0.10	ppm	0.50
Lead	< 0.20	ppm	1.50
Mercury	< 0.05	ppm	0.30
Selenium	0.23	ppm	0.50
Mycotoxin			
Aflatoxin B1, B2, G1, G2	< 5.00	ppb	5.00
Chlorinated Hydrocarbons			
Aldrin	< 0.01	ppm	0.03
Lindane	< 0.01	ppm	0.05
Chlordane	< 0.01	ppm	0.05
DDT & related substances	< 0.03	ppm	0.15
Dieldrin	< 0.02	ppm	0.03
Endrin	< 0.02	ppm	0.03
Heptachlor	< 0.01	ppm	0.03
Heptachlor Epoxide	< 0.01	ppm	0.03
Toxaphene	< 0.10	ppm	0.15
PCB's	< 0.10	ppm	0.15
a-BHC	< 0.01	ppm	0.05
b-BHC	< 0.01	ppm	0.05
d-BHC	< 0.01	ppm	0.05
Hexachlorobenzene	< 0.01	ppm	0.03
Mirex	< 0.01	ppm	0.02
Methoxychlor	< 0.05	ppm	0.50
Organophosphates			
Thimet	< 0.15	ppm	0.50
Diazinon	< 0.14	ppm	0.50
Disulfoton	< 0.15	ppm	0.50
Methyl Parathion	< 0.14	ppm	0.50
Malathion	< 0.14	ppm	0.50
Parathion	< 0.12	ppm	0.50
Thiodan	< 0.02	ppm	0.50
Ethion	< 0.14	ppm	0.50
Tritton	< 0.15	ppm	0.50

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Annex 4. Laboratory animal diet certification report (continued)

Laboratory Diet Certification Report

Teklad Certified Irradiated Global 18% Protein Rodent Diet

2918C



Lot Number 2918C-021114MA

Date of Manufacture 02/11/14

Report Date 03/03/14

The following data is a consolidation of results obtained from one or more independent testing laboratories. The actual laboratory results are available upon request.

Kurt Schaefer
Quality Assurance Coordinator, Teklad Diet
Research Models and Services
Harlan Laboratories, Inc.

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Proximate Analysis

Analysis	Result (%)
Protein	17.50
Fat	5.91
Fiber	2.98
Moisture	12.83
Ash	5.44
Calcium	1.03
Phosphorus	0.70

Feed Contaminant Screen

Analysis	Result	Units	Established Maximum Concentration
Heavy Metals			
Arsenic	0.16	ppm	1.00
Cadmium	< 0.10	ppm	0.50
Lead	< 0.20	ppm	1.50
Mercury	< 0.05	ppm	0.20
Selenium	0.25	ppm	0.50
Mycotoxin			
Aflatoxin B1, B2, G1, G2	< 5.00	ppb	5.00
Chlorinated Hydrocarbons			
Aldrin	< 0.01	ppm	0.03
Lindane	< 0.01	ppm	0.05
Chlordane	< 0.01	ppm	0.05
DDT & related substances	< 0.03	ppm	0.15
Dieldrin	< 0.02	ppm	0.03
Endrin	< 0.02	ppm	0.03
Heptachlor	< 0.01	ppm	0.03
Heptachlor Epoxide	< 0.01	ppm	0.03
Toxaphene	< 0.10	ppm	0.15
PCB's	< 0.10	ppm	0.15
a-BHC	< 0.01	ppm	0.05
b-BHC	< 0.01	ppm	0.05
d-BHC	< 0.01	ppm	0.05
Hexachlorobenzene	< 0.01	ppm	0.03
Mirex	< 0.01	ppm	0.02
Methoxychlor	< 0.05	ppm	0.50
Organophosphates			
Thimet	< 0.15	ppm	0.50
Diazinon	< 0.14	ppm	0.50
Disulfoton	< 0.15	ppm	0.50
Methyl Parathion	< 0.14	ppm	0.50
Malathion	< 0.14	ppm	0.50
Parathion	< 0.12	ppm	0.50
Thiodan	< 0.02	ppm	0.50
Ethion	< 0.14	ppm	0.50
Trition	< 0.15	ppm	0.50

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Annex 4. Laboratory animal diet certification report (continued)

Laboratory Diet Certification Report**Teklad Certified Irradiated Global 18% Protein Rodent Diet****2918C**Lot Number 2918C-041514MADate of Manufacture 04/15/14Report Date 05/05/14

The following data is a consolidation of results obtained from one or more independent testing laboratories. The actual laboratory results are available upon request.

Kurt Schaefer
Quality Assurance Coordinator, Teklad Diets
Research Models and Services
Harlan Laboratories, Inc.

I have reviewed this
document
2014.05.05 13:42:00
-05'00'

Proximate Analysis

Analysis	Result (%)
Protein	18.10
Fat	5.92
Fiber	3.07
Moisture	12.59
Ash	5.31
Calcium	0.97
Phosphorus	0.67

Feed Contaminant Screen

Analysis	Result	Units	Established Maximum Concentration
Heavy Metals			
Arsenic	0.15	ppm	1.00
Cadmium	< 0.10	ppm	0.50
Lead	< 0.20	ppm	1.50
Mercury	< 0.05	ppm	0.20
Selenium	0.26	ppm	0.50
Mycotoxin			
Aflatoxin B1, B2, G1, G2	< 5.00	ppb	5.00
Chlorinated Hydrocarbons			
Aldrin	< 0.01	ppm	0.03
Lindane	< 0.01	ppm	0.05
Chlordane	< 0.01	ppm	0.05
DDT & related substances	< 0.03	ppm	0.15
Dieldrin	< 0.02	ppm	0.03
Endrin	< 0.02	ppm	0.03
Heptachlor	< 0.01	ppm	0.03
Heptachlor Epoxide	< 0.01	ppm	0.03
Toxaphene	< 0.10	ppm	0.15
PCB's	< 0.10	ppm	0.15
a-BHC	< 0.01	ppm	0.05
b-BHC	< 0.01	ppm	0.05
d-BHC	< 0.01	ppm	0.05
Hexachlorobenzene	< 0.01	ppm	0.03
Mirex	< 0.01	ppm	0.02
Methoxychlor	< 0.05	ppm	0.50
Organophosphates			
Thimet	< 0.15	ppm	0.50
Diazinon	< 0.14	ppm	0.50
Disulfoton	< 0.15	ppm	0.50
Methyl Parathion	< 0.14	ppm	0.50
Malathion	< 0.14	ppm	0.50
Parathion	< 0.12	ppm	0.50
Thiodan	< 0.02	ppm	0.50
Ethion	< 0.14	ppm	0.50
Trithon	< 0.15	ppm	0.50

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Annex 5. Certification of tap water analysis report

5179-9300-2556-6526

TEST REPORT

1. No : PC14-00225

Reissuance (R1)

2. Client :

Date : Mar. 17, 2014

 Name : Korea Conformity Laboratories(Incheon) Address : 7-44, Songdo-dong, Yeonsu-gu, Incheon, Korea Date of Receipt : Feb 28, 2014 Date of Issued : Mar 17, 2014

3. Use of Report : Reference

4. Test Sample : Drinking Water (Animal room)

5. Method :

(1) Notification No. 2013-136 of the Ministry of Environment.

Affirmation	Tested By Name : Hyoung jun Seok	Seok.	Technical Manager Name : Yoong Kook Lee	Y.K. Lee
-------------	-------------------------------------	-------	--	----------

Our report apply only to the standards or procedures identified and to the sample(s) tested unless otherwise specified. The test results are not indicative of representative of the qualities of the qualities of the lot from which the sample was taken or of apparently identical or similar products.

Korea Conformity Laboratories President Song Jae Bin *Jae Bin Song*

Address : 153-803 199, Gasan digital 1-ro, Geumcheon-gu, Seoul, Korea 82-2-2102-2500

Result Inquiry : Environmental Testing Center 82-2-2102-2598

Annex 5. Certification of tap water analysis report (continued)

TEST REPORT

No : PC14-00225

6. Test Results

1) 1) Drinking Water (Animal room)

Test Item(s)	Unit	Limitation(s)	LOQ	Test method used	Test Result(s)
Total colony counts	CFU/mL	Less than 100	0	(1)	0
Total coliforms	-/(100mL)	Not detected	-	(1)	Not detected
E-Coli	-/(100mL)	Not detected	-	(1)	Not detected
Lead	mg/L	Less than 0.01	0.005	(1)	Not detected
Arsenic	mg/L	Less than 0.01	0.005	(1)	Not detected
Selenium	mg/L	Less than 0.01	0.005	(1)	Not detected
Cadmium	mg/L	Less than 0.005	0.002	(1)	Not detected
Boron	mg/L	Less than 1.0	0.01	(1)	Not detected
Copper	mg/L	Less than 1.0	0.008	(1)	0.025
Zinc	mg/L	Less than 3.0	0.002	(1)	0.018
Iron	mg/L	Less than 0.3	0.05	(1)	Not detected
Manganese	mg/L	Less than 0.3	0.005	(1)	Not detected
Aluminium	mg/L	Less than 0.2	0.02	(1)	Not detected
Mercury	mg/L	Less than 0.001	0.001	(1)	Not detected
Fluoride	mg/L	Less than 1.5	0.15	(1)	Not detected
Nitrate nitrogen	mg/L	Less than 10	0.1	(1)	0.4
Chloride	mg/L	Less than 250	0.4	(1)	1
Sulfate	mg/L	Less than 200	2	(1)	Not detected
Diazinon	mg/L	Less than 0.02	0.0005	(1)	Not detected
Parathion	mg/L	Less than 0.06	0.0005	(1)	Not detected
Fenitrothion	mg/L	Less than 0.04	0.0005	(1)	Not detected
Dichloromethane	mg/L	Less than 0.02	0.002	(1)	Not detected
1,1,1-Trichloroethane	mg/L	Less than 0.1	0.001	(1)	Not detected
Benzene	mg/L	Less than 0.01	0.001	(1)	Not detected
Toluene	mg/L	Less than 0.7	0.001	(1)	Not detected
Ethylbenzene	mg/L	Less than 0.3	0.001	(1)	Not detected
Xylene	mg/L	Less than 0.5	0.001	(1)	Not detected
1,1-Dichloroethylene	mg/L	Less than 0.03	0.001	(1)	Not detected
Tetrachlorocarbon	mg/L	Less than 0.002	0.001	(1)	Not detected
Tetrachloroethylene	mg/L	Less than 0.01	0.001	(1)	Not detected

Annex 5. Certification of tap water analysis report (continued)

TEST REPORT

No : PC14-00225

6. Test Results

1) Drinking Water (Animal room)

Test Item(s)	Unit	Limitation(s)	LOQ	Test method used	Test Result(s)
Trichloroethylene	mg/L	Less than 0.03	0.001	(1)	Not detected
1,2-Dibromo-3-Chloropropane	mg/L	Less than 0.003	0.001	(1)	Not detected
1,4-Dioxane	mg/L	Less than 0.06	0.001	(1)	Not detected
Carbaryl	mg/L	Less than 0.07	0.005	(1)	Not detected
Formaldehyde	mg/L	Less than 0.5	0.02	(1)	Not detected
Chromium	mg/L	Less than 0.05	0.03	(1)	Not detected
Ammonium Nitrogen	mg/L	Less than 0.5	0.01	(1)	Not detected
Phenol	mg/L	Less than 0.005	0.005	(1)	Not detected
Alkyl Benzene Sulfate	mg/L	Less than 0.5	0.1	(1)	Not detected
Cyanide	mg/L	Less than 0.01	0.01	(1)	Not detected
pH	-	5.8 ~ 8.5	-	(1)	6.6
Turbidity	NTU	Less than 1	0.02	(1)	0.06
Color	degree	Less than 5	1	(1)	Not detected
Taste	-	Free	-	(1)	Pass
Odor	-	Free	-	(1)	Pass
Hardness	mg/L	Less than 300	1	(1)	Not detected
Consumption of KMnO ₄	mg/L	Less than 10	0.3	(1)	0.3
Total solids	mg/L	Less than 500	2	(1)	6

— End of Report —

Annex 6. KCL GLP certification of NIER

지정번호 (Certification No.)		화학물질 유해성 시험기관 지정서 GLP Certificate	
①	시험기관 Test Facility Name	한국생활환경시험연구원 안전성평가본부 Korea Environment and Merchandise Testing Institute Bio-Safety Evaluation Headquarters	
	소재지 Address	인천광역시 연수구 송도동 7-44 7-44, Songdo-Dong, Yeonsu-Gu, Incheon, 406-840, Korea	
③	대표자 President	김창로 Chang-Ro Kim	
	운영책임자 Test Facility Management	유일재 Il-Je Yu	
⑤	시험의 범위 Test Scope	<ul style="list-style-type: none"> - 금성경구독성시험, 유전독성시험(복귀률연변이시험, 염색체이상시험, 소핵시험). (유효기간 : 2006년 3월 31일부터). 끝. - 금성피부자극성 및 부식성시험, 금성안자극성 및 부식성시험, 금성흡입독성시험. (유효기간 : 2007년 4월 17일부터). 끝. - 아금성독성시험, 피부감작성시험. (유효기간 : 2008년 8월 25일부터). 끝. <ul style="list-style-type: none"> - Acute oral toxicity, Genetic Toxicity(Ames test, Chromosome abberation test, Micronucleus test) (Validation : since Mar. 31, 2006). - Acute dermal irritation/corrosion, Acute eye irritation/ corrosion, Acute inhalation toxicity (Validation : since Apr. 17, 2007). - Subchronic toxicity, Skin sensitization (Validation : since Aug. 25, 2008). 	
<p>「유해화학물질관리법」 제14조, 같은 법 시행령 제12조 및 같은 법 시행규칙 제10조제2항에 따라 화학물질 유해성 시험기관(GLP시험기관)으로 지정합니다.</p> <p>It is hereby certified that the test facility was inspected by the national compliance monitoring authority regarding compliance with the Principles of Good Laboratory Practice.</p> <p>Issue date 2008년(year) 8월(month) 25일(date)</p> <p>국립환경과학원장 President, National Institute of Environmental Research</p> 			

Annex 7. KCL GLP certification of NIER (continued)

(뒤 쪽)-1

<변경사항>

일자	내용	확인
2009. 5. 20	운영책임자 변경 : 유 일 재 (Il-Je Yu)에서 송 성 썩 (Kyung-Seuk Song)으로 변경	
2009. 11. 16 (수정)	시험의 범위 : 유행성피토신 시험, 어류급성독성시험 (유효기간: 2009년 11월 16일부터) 끝.	
" (영문)	Test Scope : Acute dermal toxicity, Fish acute toxicity (Validation : since Nov. 16, 2009).	
2010. 8. 2	대표자 변경 : 김 창 로 (Chang-ro Kim)에서 오태식 (Taeshik Oh)로 변경	G L P 확인
2010. 8. 2	기관별 변경 : 한국인증연합환경시험연구원 바이오융합부문 *중합연 (Biconvergence Technology Division, Korea Conformity Laboratories)입니다	G L P 확인
2011. 9. 9	운영책임자 변경 : 송 성 썩 (Kyung-Seuk Song)에서 이 전 규 (Jin Kyu Lee)으로 변경	G L P 확인

<처분사항>

일자	내용	확인

<참고사항>

일자	내용	확인
2010. 12.	정기사후평가 결과, GLP규정을 준수하고 있음 (GLP Compliance)	G L P 확인
2012. 7. 2	정기사후평가 결과, GLP규정을 준수하고 있음 (GLP Compliance)	G L P 확인

Annex 7. KCL GLP certification of NIER (continued)

화학물질유해성시험기관 지정서
제2008-4호

(뒤 쪽)-2

<변경사항>

일자	내용	확인
2011. 9. 9	기관명변경: "한국건설생활환경시험연구원 바이오융합단"으로 변경 (Bioconvergence Technology Department, Korea Conformity Laboratories)	G L P 확인
2011. 11. 3	대표자 변경 : 오태석 (Taeshik Oh)에서 송재빈 (Jae Bin Song)으로 변경	G L P 확인
2012. 7. 2	기관명변경 : "한국건설생활환경시험연구원 바이오융합단"로 변경 (Bioconvergence Technology Laboratory, Korea Conformity Laboratories)	G L P 확인
2012. 7. 2	시험의 범위 : 물체류 흡연물 시험, 조류장장구제시험 [Test Scope: Daphnia sp. acute toxicity, Algae: growth inhibition (since July, 2, 2012)]	G L P 확인

<처분사항>

일자	내용	확인

<참고사항>

일자	내용	확인

Annex 8. KCL GLP certification of NIER

신뢰성 보증 확인서

시험번호 : GT14-00042

시험명 : Fisher 344 랫드를 이용한 MWCNT의 아반성 흡입독성시험

이 보고서에 기술된 시험을 독립적으로 아래와 같이 시험과정 단계별로 점검하였으며 각 점검결과를 표준작업지침서에 따라 시험책임자와 운영책임자에게 통보 및 보고하였다.

본 시험은 국립환경과학원고시 2013-1 호(2013년 01월 09일) '화학물질유해성시험기관 지정 및 관리기준', 국립환경과학원 고시 2013-2 호(2013년 01월 09일) '화학물질유해성시험방법' 및 OECD Guidelines for the Testing of Chemical No. 413 'Subchronic Inhalation Toxicity: 90-Day Study'(Adopted 7th Sep, 2009)에 따라 수행되었으며, 보고서 작성 방법 및 결과의 기술이 시험의 실시과정에서 발생한 시험기초자료를 바탕으로 정확히 반영되었음을 확인하였다.

점검 내용	실시일	시험책임자에게 통보일	운영책임자에게 보고일
시험계획서 점검	2014. 01. 28	2014. 01. 28	2014. 01. 28
동물입수	2014. 02. 06	2014. 02. 06	2014. 02. 06
시험물질 및 대조물질	2014. 02. 06	2014. 02. 06	2014. 02. 06
시험물질조제	2014. 02. 13	2014. 02. 13	2014. 02. 13
	2014. 03. 27	2014. 03. 27	2014. 03. 31
	2014. 04. 30	2014. 04. 30	2014. 04. 30
동물사육 및 투여	2014. 02. 13	2014. 02. 13	2014. 02. 13
	2014. 03. 27	2014. 03. 27	2014. 03. 31
	2014. 04. 30	2014. 04. 30	2014. 04. 30
증상관찰 및 측정	2014. 02. 13	2014. 02. 13	2014. 02. 13
	2014. 03. 27	2014. 03. 27	2014. 03. 31
	2014. 04. 30	2014. 04. 30	2014. 04. 30
안검사 및 노검사	2014. 05. 10	2014. 05. 10	2014. 05. 12
부검 및 임상병리	2014. 05. 13	2014. 05. 13	2014. 05. 13
	2014. 05. 14	2014. 05. 14	2014. 05. 14
	2014. 05. 15	2014. 05. 15	2014. 05. 15
	2014. 05. 16	2014. 05. 16	2014. 05. 16
	2014. 08. 12	2014. 08. 12	2014. 08. 12

Annex 8. KCL GLP certification of NIER (continued)

검체제작 및 검증	2014. 06. 19	2014. 06. 19	2014. 06. 19
	2014. 07. 22	2014. 07. 22	2014. 07. 22
	2014. 09. 24	2014. 09. 24	2014. 09. 24
시험기초자료 접검	2014. 11. 18	2014. 11. 18	2014. 11. 18
최종보고서 접검	2014. 11. 18	2014. 11. 18	2014. 11. 18

한국건설생활환경시험연구원 바이오융합연구소

신뢰성보증책임자

송 경석 (인장)

2014년 11 월 12 일



Annex 9. Study personnel-Original

시험관계자서명

주 시험담당자

성재혁

주 시험담당자

날짜

2014. 11. 18.

시험물질 조제

성재혁

시험물질 조제분석 책임자

날짜

2014. 11. 18.

동물관리

김혜진

동물 관리 책임자

날짜

2014. 11. 18.

부검 및 병리

김혜진

병리 책임자

날짜

2014. 11. 18.

자료보관

김효동

자료보관 책임자

날짜

2014. 11. 18.